

Living to learn together: Sara Parker looks at efforts to integrate ARABS and JEWS in Israeli universities. Can fear and suspicion give way to genuine cooperation and understanding? (page 11)

The need to put academic skills to work in the community has heightened the profile of CONTINUING EDUCATION within Britain's universities. Felicity Jones talks to two department heads about new initiatives and hopes (page 12)



Transatlantic transplant: Peter Aspin talks to RONALD DWORNIK, professor of jurisprudence at Oxford and scholar of civil rights (page 13).

Sixteenth century ITALIAN PRINTING was the most significant of its time but up till now it has not been possible for researchers to locate surviving editions. Conon Fahy looks at the Censimento, a massive census (page 17)

EVOLUTION re-examined: Paul Harvey reviews two new studies of evolutionary thought, "a theory in crisis", while David Hull examines the first volumes of Charles Darwin's collected correspondence (page 19)

Home news	1-8
Letters to the editor	2
Patrick Nutgens	2
Don's Diary (Jacqueline Burgoyne)	4
Party Line (Jack Straw)	6
antithesis	7
Union View (AUT)	9-10
Articles	11-17
Column (Ernest Boyer)	16
Arts page	18
Books	19-24
Noticeboard	26
Classified	26-36

NEW WEEK

G. J. Watson on Shaw's letters
Re-reading Marshall McLuhan
Profile of Thomas Kuhn
What will Sir Keith find at the OU?

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The policy crisis

"Crisis" is an overworked word. Either it is used as one of those banal fast-food media clichés that has been tasted so often that it has lost any flavour of sharp meaning; or it is used as a tired apocalyptic incantation by those with a naïvely millenarian view of modern society, and so descends into a private buzz-word for introverted political cliques. So "crisis" has become a word best avoided by us stern pragmatists.

But what other word can be used to describe the present condition of Britain's universities? The supporting facts are black enough. For 10 years their planning has been disrupted and their morale battered by successive waves of unpredictable cuts. Panicky improvisation punctuated by increasingly brief periods of dishonest normality has become established as the pattern of the universities' undevelopment. Soon, with the cumulative effect of an annual 2 per cent cut stretching into an unrelenting future, there will be no more pause for complacent breath; the crisis will have become permanent.

But feelings are even more important than facts in producing a sense of accelerating crisis. Too many people in universities say things like "it isn't fun anymore" and hidden within the benign banality of such English understatement is the dead prospect of scholarly and scientific underachievement, of an intellectual sterility that will have consequences well into the next century. As another academic year closes, its summer routine of examination, graduation and congratulation complete, the universities find it difficult to feel themselves that sense of an achieved self-satisfaction they have given their students.

The approaching vacation seems to offer little opportunity for any recreative reflection. Instead it offers not much more than a brief interlude of anomie irresponsibility before an ever more oppressive reality is reimposed when the summer has gone. The dominant mood in universities today is a mixture of jittery apprehension and moral exhaustion, around which hover in uncertain orbit other emotions like philistinism, anti-intellectualism and political deference that should have no place in a free university tradition. Few escape from this ambiguous mood; in contrast to five years ago even the most protected and the most successful feel the dull hostility of the 1980s.

Many people outside the universities, in the University Grants Committee and the Department of Education and Science, will complain that this is an exaggerated portrait of the state of feeling within them. Even if they are forced to concede that morale is low they will insist that such feelings are unreasonable or unnecessarily pessimistic. They will defend themselves vigorously, and honestly, against the implied charges of premeditated hostility and uncaring philistinism. They will argue that the universities' present troubles are a temporary interlude, a painful adjustment to a post-Robbins (post-prosperity?) world that will soon

be over—for some. According to them a filter tougher university system will emerge. So the universities must be patient and in the meantime maintain their morale.

This is not a credible argument—and not only because there seems to be little prospect of the university cuts coming to an end under present political circumstances as of the long anticipated fall in unemployment. It lacks credibility also because it suggests that politicians, elected and unelected, command events rather than being commanded by them. Yet the 10-year-old university crisis suggests precisely the opposite, that it has been the product of a jumble of unavoidable circumstance and avoidable prejudice that was elevated retrospectively and self-servingly into an allegedly coherent policy.

First in the mid 1970s the old quinquennialism with its assurance of secure and growing university income was swept away. After two years of chaotic improvisation, a precarious recovery took place in the Callaghan years with a rolling triennium as a pallid successor to the gilt-edged quinquennialism. That recovery in turn was disrupted when in 1979, despite a promise of level-funding, the new Conservative Government introduced its get-tough act-silly (and now much modified) policy of "full costs" fees for overseas students which cost universities millions.

A year later in the winter of 1980 even the mirage of level-funding disappeared when Mrs Thatcher's Government ordered its first real assault on public expenditure. The following summer the UGC was left with the unpalatable task of sharing out the resulting 15 per cent cut which were the universities' involuntary contribution to this national endeavour. The next two-and-a-half years from the end of 1981 until the summer of 1984, were occupied by efforts to restore an illusion of normal business. The misnamed "restructuring" fund, the new blood programme, the IT initiative, even the UGC's rather histrionic "great debate", all contributed to this precarious recovery of morale.

But there was to be no respite. Realistic level-funding, which the UGC had demanded in its strategy advice, was never a feasible outcome. Instead universities were told, well before the publication of the allegedly scene-setting Green Paper, to prepare for 2 per cent cuts a year compound stretching away into the 1990s. The Jarratt report with its offensively managerial language provided a further sharp (psychological) shock. Already sharp paraphernalia of crisis are being wheeled out again—at St. Andrews and Stirling, at Sheffield, at Birmingham.

Amid the collapsing morale that will accompany the economy and selectively packages which universities will have no option but to propose, the main conclusion to be drawn from this misadventure is that at some ill-defined time during the 1970s the great sweep

of secular opinion turned against the universities; the evidence for this is more emotional than reasonable. It is not that a virulently anti-university Government came to fortuitous power; with well signalled exceptions like the Open University, the Polytechnic of North London and the (former) Social Science Research Council there is no strong evidence that the present Government's approach to universities is significantly different from that of all its predecessors since 1945.

No, the main conclusion to be drawn is that for nearly all this unhappy decade policy stumbled along behind events. Cuts were imposed for good reason (the 1973 oil-price recession), for bad reason (Mrs Thatcher's determination to clobber public expenditure in 1980), and for no reason at all ("full cost" fees for overseas students). Only belatedly did anything recognizable as a university policy emerge. In 1981 of course the DES never even attempted to produce a policy; it was left properly but anachronistically to the UGC. On nearly every occasion since 1973 serious policy making, useful guidance to universities about how they should live within their arbitrarily reduced means, have lagged two or three years behind the determining events. Yet universities had to take immediate decisions, just to stay academically and in the worst cases financially viable.

It is not yet clear that this lesson has been properly learnt. Under Sir Peter Swinnerton-Dyer the UGC has opened its doors, although not all its books, to the DES. A common view is that this represents a kind of capitulation to the politicians. Maybe in the short run it is. But by placing greater responsibility on the DES is long-term effect may be to oblige the department to evolve a proper university policy. It may help to restore that edge of DES patronage now enjoyed by the National Advisory Body.

The UGC has started to work at a frenetic pace. Again it is easy to criticize the committee's new quick-fire, one-sheet-of-A4 approach to university planning. But the simple truth is that unless the UGC works very fast indeed it can have little influence over the emerging shape of rationalization; it can hope to offer no useful guidance to the beleaguered universities. Some of course believe that detailed UGC guidance is the last thing universities need, that it is either in vain or pernicious; certainly the committee's present policy "flavour" is not especially appealing. But that is a subject for another week. But to write off the UGC and to leave universities to their own expedient and desperate devices is to acquiesce in a descent into Darwinian jungle and to deny that there is any possibility of this Government or its successors being confronted with a coherent university policy, which they will have to take seriously and on which a long-term recovery can be built. The universities must be able to think their way out of their present crisis before they can spend their way out of it.

New chance for youth

The decision to go ahead with a two-year Youth Training Scheme represents both a golden opportunity and a very real danger for both £1 billion of public money and, much more importantly, for the prospects of thousands of teenagers. Few would argue with the Government about the pressing need to expand the training system and to make fundamental changes in the VTS. The question is whether the new programme can live up to the entirely laudable objectives set for it by the Manpower Services Commission, or whether it will become merely a protected way of keeping teenagers out of the dole queues on low wages.

Looking on the bright side, a two-year scheme obviously offers greater scope for genuinely vocational training, to take place and the emphasis on obtaining a qualification in the second year is a welcome and necessary step in

that direction. There would be little excuse for some of the activities which have masqueraded as training being approved in a two-year scheme. The proposed training agreement between the trainee and the college or employer, setting out the terms, responsibilities and objectives of each, could also help improve the content of the programme, although it remains to be seen how this works in practice. Everything will depend on the ability of the MSC to deliver its promise to keep a close rein on "approved training organizations". Its new training moth task in front of it, starting from scratch, inspecting the wide variety of schemes being proposed and monitoring them all.

Experience of the YTS thus far hardly inspires confidence. Much of the work which has taken place, particularly in the private sector, has been a travesty of the objectives of the scheme and has left a residue of bitterness among many young people forced into the YTS. The revamped scheme has a long way to go in winning them over and no doubt many will see the addition of only seven weeks to the minimum period of further education or off-the-job training as a bad sign.

Yet the new scheme has to be given a chance to prove itself. A two-year programme does no more than bring Britain into line with several industrial competitors and, although there are obvious political advantages for the Government in reducing unemployment figures, £1 billion a year does represent a substantial commitment to the new scheme. If the MSC can achieve its aim to "provide high quality training and be seen to do so" it will be

Laurie Taylor



Dear Professor Lapping, I'm so sorry to interrupt you during your subliminal year but I wonder if I might trouble you for your list of books for next term's courses. (You will recall that the professorial minimum for each course is now three books, all of which must already be in stock, and two of which must have some relevance to your "associate" department—this year, the department of neurosurgery.)

While I'm writing, may I also pass on the sad news that our old librarian, Dr Sieveking, will not be with us during the coming academic year (or indeed any of the years after that).

As you will know, Dr Sieveking was highly respected in this university. Even during those difficult post-Atkinson days, when his determination to find extra storage space for the "self-renewing" library led to that unfortunate overstocking of his own bedroom and the tragic infection of Mrs Sieveking—even during those years he maintained a sense of dignity and determination which was an inspiration to all of us "behind the issue desk".

True, there was the occasional difference of opinion with colleagues, particularly over the introduction of the GEAC issuing system. Dr Sieveking was essentially a librarian of the old school—and always maintained that the traditional system of stamping books with the date (his own preference was for red ink) was an important psychological device for establishing in the borrower's mind that the book was someone else's property.

None of this suggested, however, that he would react so strongly to the V-C's decision following the third great periodical review, that *The Proceedings of the Aristotelian Society* should be discontinued on the grounds that Aristotle was "totally out of date" and that the book was "a major technological growth area" in the immediate future.

Given the vice chancellor's new post-Jarratt powers (you may now already that he has changed his title to "President" and arranged for the erection of a small podium in Committee Room W208 so as to allow him to speak with slightly more authority to the professional board) confrontation was inevitable.

It was a very brief episode. The vice chancellor entered the library with the deputy head porter and demanded that Sieveking hand over the most recent copy of the *Journal (Vol XIV, No. 1076, pp 1-184)*. For a second they both stood their ground. Sieveking in front of the GEAC VDU with the *Proceedings* clamped to his chest; the vice chancellor equally impressive in his Cambridge academic gown and thick-length black boots. And then Sieveking simply capitulated, simultaneously handing over the *Proceedings* and a letter of resignation.

A sad loss. But then as your Doctor Piercemiller was saying to me the other day when I bumped into him outside the LotosFun Leisure Arcade in town, our loss is probably Marzies' gain. They certainly seem to have given him a comfortable niche, although I'm not certain if his range of periodicals is as extensive as he might wish. Those 12s fairly zip through Grantham. Please give my regards to Mrs Lapping. Best wishes, R. Toddunter

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Marius, the famous showjumping horse, has been marketed for stud by Wales Polytechnic student Fiona Rogers (left) as part of her business studies higher national diploma.

Marius earned £100,000 when ridden by the late Caroline Bradley, winning among other trophies, the Queen Elizabeth Cup. After Miss Bradley died the Dutch-born stallion disappeared into obscurity, became ill, and was eventually discovered and

A horse for a course

bought for a few hundred pounds by Wales poly business studies lecturer Miss Margaret Esher (right). Miss Esher nursed him back to health, and decided to market him for stud. Fiona was looking for a

project for her HND, and took Marius on. She designed a Marius logo, advertised him, offered him in competitions, investigated artificial insemination and recently the first foal he sired was born.

Now another HND student at the polytechnic is to take on Marius for another year, while Miss Esher contemplates the possibility of the study of the rise, fall and rise again of Marius as the subject for a PhD.

PCL management rapped over Libya

by Karen Gold

Senior management at the Polytechnic of Central London failed to exercise financial control over the polytechnic's international activities, leading to a £220,000 deficit on a broken contract with Libya, according to two confidential reports going to the polytechnic's court on Monday.

The reports are by a special committee set up by the court to investigate the Libyan affair, and by the Greater London Council audit branch. Both are highly critical of the polytechnic's senior management, and of Dr Bill Moore, the former head of PCL International Services who set up the 1983 contract to teach Libyan students in Malta later broken off by the Libyans. The audit report says there was failure to exercise proper control over the Malta project at all levels of PCL management, and that even after the weakness leading to this had been drawn to management and court attention, no effective action had been taken.

The committee of inquiry's report says it "discovered with alarm that within PCL Dr Moore was unique in his unaccountability to anyone and his ability to bypass PCL procedures and conventions on finance and financial control. Systems applicable to all members of staff, up to and including the rector, did not seem to apply to Dr Moore."

"As head of the institution, the responsibility stopped at the rector's desk" the report continues. "The committee expects the rector to acknowledge the pressing need to reinforce and readress the requirements of management. The necessity to strengthen lines of accountability is self-evident."

of the Libyan deal. On finance the audit reports there was no evidence on limits of expenditure on single items or overall on Dr Moore, nor did the poly's finance officer check the validity of expenditure by referring to a budget. There was no provision in the budget for purchasing equipment, and no budget for £200,000 spent since July 1983. Tenders were not sought for £230,000 of equipment and no inventory or stock taking was done. The deficit on the project is still increasing by £6,000 a month, while equipment belonging to PCL remains in Malta.

On staffing, the audit report says Dr Moore alone initiated teachers' contracts although these were processed through the polytechnic personnel office; he appointed them, varied their scales of payment and conditions of service and made *ex gratia* settlements. He also renewed his wife's contract with International Services.

The Libyans are understood to have withdrawn from the college after their course was not accredited by the Business and Technician Education Council. The inquiry says that "unsound decision-making and extremely sloppy administrative actions, compounded by an absence of professional advice, led to the complete inability of PCL to deliver accreditation in respect of the BTCE course".

Union divided over pay deal

by David Jobbins

The fate of a carefully-balanced management package designed to end the college lecturers' pay dispute hangs in the balance with union leaders divided over its acceptability as a basis for negotiation.

The potential deal emerged from a 12-hour session of the Burnham further education committee and would give lecturers 5 per cent from May 1, and a further 2 per cent from November 1 dependent on the presentation of a joint union-management report on structure talks and the prospects of clawing back some of the costs of the deal.

Although those at the top of the Lecturers' scale will move automatically on to Lecturer 2 salaries under the plan, they will not have the more

continued on page 3

Joseph keeps up pressure on standards

Government pressure on universities to do more to guarantee rigorous teaching and examination standards will continue, the Secretary of State for Education and Science Sir Keith Joseph has warned. Universities were under a particular obligation to ensure quality because—at present—they were not subject to external controls, said Sir Keith. He was speaking at a conference on the Government's Green Paper on the development of higher education, organized by the Society for Research into Higher Education, and *The Times*.

"Preservation of standards in quality and examinations is something which, under present arrangements, I can only see being done by the universities themselves," he said. "What disturbs me is that it is really only in the past two or three years... that the universities in particular have begun to pay serious attention to questions of their arrangements and machinery for ensuring quality in teaching."

The Government would pursue its policy on quality into research selectively, he said, but his concern in seeking respect for research and scholarship was also that this should not be extended to "the second-rate."

"I am unashamedly the enemy of whatever in higher education may be of poor quality, pretentious, over-



Thomas Kuhn: an occasional revolutionary, 11

quality depended upon the provision of any particular historical level or resource, he said.

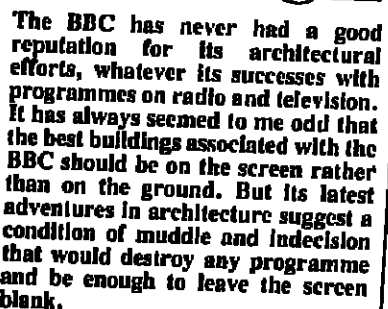
"Although the Green Paper rejects the idea of a validating body for universities, I am still not convinced that the universities in particular have begun to pay serious attention to questions of their arrangements and machinery for ensuring quality in teaching."

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Letters to the editor

Kendrew: the wrong question



The BBC has never had a good reputation for its architectural efforts, whatever its successes with programmes on radio and television. It has always seemed to me that the best buildings associated with the BBC should be on the screen rather than on the ground. But its latest adventures in architecture suggest a condition of muddle and indecision that would destroy any programme and be enough to leave the screen blank.

It has now been announced that the proposed new radio headquarters in Langham Place will not be built. Instead the corporation has bought for £30 million a site at the White City, where they will build both a radio centre and offices, possibly employing different firms of architects for the different functions. So Foster Associates, who have been working on the Langham proposals for the last three years, may or may not continue with the job. The chairman of the BBC has indicated that he does not think the high-tech approach appropriate for the White City.

Norman Foster's design for the radio headquarters that would have replaced the Langham Hotel was brilliant in conception and promised to be a major contribution to the development of architectural technology. On such a central site it would also have been a public expression of society's faith in modern architecture. The first designs attempted to put too much on the site; once that had been corrected it gave every sign of aesthetic as well as technological success.

It would have cost at least £100 million. Since the architects had developed it as far as the stage of planning consent the architects' fees must be between £3 million and £5 million. At a time when the licence fee is much in dispute it is to be hoped that that money has been profitably spent.

What was particularly brilliant about the design was the way in which it would have changed and completed one of the most characteristic pieces of English town planning. When property ownerships prevented Nash from driving a classical straight avenue from the top of Regent Street to Regent's Park he produced a deliciously ingenious solution to the change in axes by shifting them round All Souls Langham Place - a solution known to every student of town planning. Broadcasting House, designed by Val Myers in 1931, did nothing to improve that; its extension after the Second World War destroyed the skyline and diminished the effect of the spine of All Souls.

Nor had the Langham Hotel by Giles and Murray 1864 done much to improve the environment. It is clumsy in outline and poor in detail. What Norman Foster proposed was to demolish it altogether and drive a great pedestrian avenue diagonally through the site from All Souls to Cavendish Square. I believe it would have created one of the showpieces of London and been a new set piece of English town planning.

But I also believe it was fundamentally absurd to put the radio building in the centre of the city, with no possibility of expansion and poor access for vehicles. The Peat Marwick Report rightly criticized the BBC for failing to look at non-central sites. Now they have a chance. They should make use of all the development work by Foster, produce a high-tech complex and move the BBC village of some 20 central buildings to a more sensible location. It is not too late for an exercise in rationality and imagination.

Patrick Nuttgens

Sir - The appearance of the long-awaited Kendrew report on the future of high-energy physics has been greeted by a chorus of criticism; criticism which is richly deserved. The expected anger of particle physicists has been complemented by the scorn of the press. The Times leader of June 24 seemed to disagree profoundly with the thrust of the report, concluding that "Withdrawal from the European Centre for Nuclear Research would do more harm to the esteem and animal spirits of the scientific community in this country than any good the redistributed funds might do." The *THES* was even more scathing, saying that "Kendrew is a lost opportunity to grapple with the hard choices facing the British research establishment. Only *Nature* seemed to cautiously welcome Kendrew, though at the same time stating that it was answering the wrong question.

It is the final point which is the most obvious reason for the opprobrium with which Kendrew has been greeted. Given the nature and background of the inquiry, it was almost inconceivable that its conclusions would satisfy anyone. Even the members of the committee itself. It is an open secret that there were very grave differences of opinion among the members, so that at one point a minority report appeared possible. The consequent compromises have led to a document replete with contradictions and of little intellectual value.

Section H2 of the report begins by commenting on the excellence and achievements of CERN and UK particle physicists and ends with the assertion that the level of expenditure on particle physics must be reduced as rapidly as possible. A view which seems somewhat at odds with Sir Keith Joseph's much vaunted criteria in the recent Green Paper on higher education. Section H3 asserts that British withdrawal from CERN would be "... a major blow to the science both of the UK and the rest of Europe". However the committee immediately follows this by recommending a 25 per cent cut in the CERN budget, a cut much bigger than the 16 per cent which



Report author: Sir John Kendrew would be caused by the proposed alternative of the UK's unilateral withdrawal and therefore one presumes much more damaging to European science. Moreover, all commentators agree that the chances of our European partners agreeing to such a cut are very small, particularly in view of the almost 20 per cent decrease in real terms of the CERN budget over the last decade. Perhaps the most amazing assertion is contained in section H5, where the committee opine that "... it would not be counter to the long term interests of the field if the pace [of research] could be reduced world-wide and not merely at CERN". Those of us working in the field have long been concerned about the very long "lead-in" times involved in particle physics. It is not unusual for the design and construction of an accelerator and its associated experiments to last seven or more years. Stretching this out even further would merely have the effect of discouraging young people from entering the field, a consequence probably not unwelcome to at least some of the members of Kendrew.

The root of the problem is, in fact, quite simple. I quote from the dissenting document written by Chris Llewellyn Smith, the only particle physicist involved in the committee, though only as a consultant, not a full member: "The real issue facing all

branches of science in the UK is the erosion of our superb scientific tradition brought about by the inadequate level of the science budget. "No part of British science has a prouder tradition or a better record of accomplishment than particle physics. Particle physicists are well aware of the serious situation in other branches of science where many first class research projects are not being carried out because of lack of funding; however, it seems a little strange to solve this problem by not funding proposals in high energy physics which Kendrew himself admits are also first class.

The battle now being joined is not merely for the future of high energy physics, but for that of all British civil science. Kendrew admits that even the draconian cuts it recommends will "represent only a small contribution to the solution of the UK science research funding problem". On the other hand, the diversion of, for instance, only about 0.5 per cent of the funds flowing into the "black hole" of military research and development would more than compensate the saving Kendrew proposes on particle physics; diverting, say, 2 per cent would virtually solve the current problems in civil research, and, incidentally, still leave a much higher sum as a proportion of the gross national product than for any other western nation.

Even within the confines of a tight fiscal policy, the British government could by this mechanism ensure the health not only of particle physics but of the whole of UK science. To give them credit, one suspects that some of the contradictions of the Kendrew report stem from the committee's realization that they were indeed not answering the right question. It is now up to the Government to face up to the issues and to ensure the necessary funds to prevent Britain from sliding inexorably into the second or third ranks of scientific nations.

Yours faithfully,
BRIAN FOSTER,
H. H. Wills Physics Laboratory,
University of Bristol.

Varying degrees

Sir - All strength to Geoff Payne in his analysis of degree results by discipline (*THES*, June 26); it is a fascinating study, highlighted 20 years ago in a neglected annex of the Robbins report, and included, at least by implication, in the brief for the recent timetable inquiry. In the event our timetable still think it deserves. It has always seemed to me to be one of the most puzzling aspects of the higher education community that the kinds of disparity Payne points out, although well-known for decades, are accepted with so little comment and no real study.

We all know that the honours grading system is arbitrary and imperfect, yet we are deeply attached to it and are impervious to criticisms of it, as I found when, some years ago, I proposed to a CNAA committee a revised regulations that the classification of honours degrees be discontinued. I had no support, then or at any other time.

Payne is perhaps a little unfair to the public sector validation report in isolating the "percentage of first" comment; it was in fact only one of five points in paragraph 12.11 which discussed comparability of degree awards across the binary line, and great emphasis was not attached to it - though I imagine that if the admittedly small and perhaps hardly significant difference in the proportion of first among honours graduates on the two sides of the line had had the opposite sign some eyebrows might have been raised - though not mine. The persistence of the disciplinary patterns of honours awards across the binary line (or perhaps their transference from the universities to the public sector as the latter has developed) speaks of a cultural conservatism which is apparently deeply embedded in our academic traditions.

Yours faithfully,
NORMAN LINDOP,
British School of Osteopathy.

Mine union 'ignored evidence'

Arguments produced by academic specialists which could have undermined the National Coal Board's justification for closing "uneconomic" pits were ignored by the National Union of Mineworkers during the year-long dispute.

The claim was put this week at a conference on interdisciplinary perspectives on accounting at Manchester University, which featured several academics who had written on the dispute, but whose work was scarcely picked up by either side.

Professor David Cooper, from the University of Manchester Institute of Science and Technology, wrote a study in *Accountancy* magazine which claimed that the arguments for closing Cortonwood were based on ambiguous accounting figures, capable of various interpretations.

But the NUM did not take up the argument very seriously in the course of the dispute. "It brings into question the rule of financial analysis in industrial relations disputes," he said.

"There was certainly the feeling that the NUM wanted nothing to do with economic arguments, and concentrated on the rights of employment, the Government's industrial relations policies and the power of unions as opposed to capital. It meant the whole question of finance accounting was a managerially dominated argument."

Mr Brendan McSweeney, a senior technical officer of the Association of Certified Accountants, said it was an act of "monumental stupidity" that the NUM did not use the financial arguments produced by academics, which might have forced the NCB on to the defence.

Mr John Williams, one of a group from the University College of Wales, Aberystwyth, said they were trying to show that the conventional accounting methods used by the NCB, although widespread in their use, were not appropriate for strategic decisions on closures.

"These figures were used by the NCB to provide a neat ranking of pits to justify closures, which we showed to be misleading. But the NUM did not confront the problem of uneconomic pits during the dispute."

But Dr Andrew Glynn, from Oxford University, who worked for the union during the strike, said the coal board was evading rational argument and dialogue with the NUM for much of the 12 months, and it was over-optimistic to assume that the presentation of the financial arguments would have had any great impact.

His work concentrated on showing the social costs of pit closures, by means of lost taxation, payment of unemployment benefit and so on. "I was trying to show that the slogan 'Coal Not Doie' could be economically justified," he said.

Many accounts at the conference were critical of the delay in the report of an internal inquiry into the NCB's accounting techniques, which was due about two months ago. A four-man team, including two academics, is carrying out the inquiry, now not expected until September.

Their criticisms were fuelled by a leaked report this week of the board's new *Plan for Coal*, which allegedly aims to close at least 50 uneconomic pits with the loss of at

Livingstone attacks university

by Peter Aspden

An attempt by a group of academics at London University to set up a metropolitan studies centre has embroiled the university in the political row over the future of the Greater London Council.

The academics want to set up the centre to take over the functions of the GLC's research, intelligence and information service, which collects information on population statistics, housing, transport and other services, in the event of the council's abolition.

Their initiative has the personal backing of the vice-chancellor of London, Sir Randolph Quirk, who commended the proposal to the university council.

But the leader of the GLC, Mr Ken

Livingstone, has attacked the plan condemning it as a "crude, over-stripping operation which is full of flaws."

Urging the university senate to throw out the plan, Mr Livingstone said: "I appreciate the university has suffered from spending cuts, but that is no excuse for it to become part of the Government's cuts operation on London services."

"I am disappointed to see the university, which ought to be maintaining its reputation for political objectivity, become involved in the abolition controversy in this way."

The 10 academics involved in the plan, who are centred in University College, Birkbeck College, the London School of Economics and Queen

Mary College, have already circulated their proposals to London boroughs, although they have not been formally adopted by the university.

Mr Livingstone said the plans for the new centre provided for 35 jobs, as opposed to the 200 people currently employed in the GLC unit. "A centre of 35 people - one per borough - would be hopelessly inadequate to cover the range of services currently provided by the GLC," he said.

Members of the GLC unit were due to meet London University senators on Wednesday, when the plan was to be brought up at senate.

A spokesman for the university said that although the plan had been reported to council, it still had the status of a freelance enterprise.



Ken Livingstone: disappointed

Training attitudes 'at fault'

by Patricia Santinelli

A single department of education and training could provide central government with an even more dangerous weapon than existing structures, unless it changed its attitudes, a local authority chief warned this week.

Councillor John Pearson, chairman of Wakefield education committee and deputy chairman of the Association of Metropolitan Authorities' education committee was speaking at an education and training conference in Birmingham.

He admitted that in his darker moments he had seriously contemplated the creation of such a department as one means of providing a long overdue and badly needed national rationalization and coordination of provision. But the key lay not in a change of organizational structure but in the way people used such structures.

"Therefore unless attitudes change, the creation of such a department might enhance rather than diminish the danger to our efforts on behalf of young people. For example in a single department where daily provision to the great god of vocational training took place, the distortion of the education system would be easier, not more difficult," Mr Pearson said.

The skewing of objectives would be accomplished with greater speed and simplicity, the confusion, frustration and waste caused by interventions supported by pump-priming would increase and there would be diminution of local accountability. Altogether there would be a heavy price to pay for the apparent benefits of co-ordination and simplicity.

Mr Pearson said that what appeared to be lacking in central government was corporate planning. This seemed largely to have been replaced by a policy of idiosyncratic interventionism.

One way of changing Government attitudes was constantly to challenge and probe erroneous concepts, as well as superficial judgements and assertions such as those contained in the White Paper *Training for Jobs*.

Discussing the Youth Training Scheme, Mr Pearson deplored the lack of recognition given to local authority support of the scheme. Authorities supported a two-year YTS, mainly because of the proposed extension of off-the-job training. But he very much doubted if the assumption that employers would contribute significantly to the cost was correct.

Mr Bryan Nicholson, chairman of the MSC, said that a two-year YTS was part of a six-point action plan to improve Britain's vocational education and training system.

One of the main concerns of the plan was further and higher education admissions policy and links with employers, in particular the need to give due recognition to vocational and technical qualifications.

Colleges also faced a warning from Mr David Tinsley, head of the MSC's Open Tech programme, who said that unless they responded quickly to developments in open learning, they would miss the boat.

Open learning had given employers new levels of control over the country's training system and colleges must become more flexible in their response to such development.



Poly's study urges new role for NAB

Responsibility for educational solutions should be devolved on to colleges away from the National Advisory Body which should be given a new role, says a polytechnic study published this week.

Colleges of Higher Education between 1972 and 1982 was written by the head and two members of staff at the Centre for Institutional Studies of North East London Polytechnic.

Basically the study argues that the impact of Government policies for public sector higher education including the creation of the NAB is evidence of the failure and irrationality of the Government's educational planning during that decade.

During that period, the authors say, we moved from an "organic" approach adopted by Mrs Thatcher in 1972, which claimed to devolve responsibility on to colleges, to that of the current Secretary of State - an "architectural" approach, better described as increased centralized control of the public sector.

The authors say that the NAB's current efforts are hopeless and have no hope. But the study says that if there is a task for the NAB it should be that of formulating national problems to which individual institutions propose educational solutions, and to judge and find which solutions are most likely to help solve these problems.

Although the authors doubt that under its present administration the NAB would adopt their approach, they suggest this would require a three-stage process. The first would be a public statement by the NAB of the problems to be tackled and the criteria to be used in allocating resources.

The second would be the scrutiny of proposals by authorities for their institutions to tackle these problems and the allocation of funds. A third continuing component would be the monitoring and evaluation of institutions' authorities and the NAB's performance.

Colleges of Higher Education 1972 to 1982: the Central Management of Organic Change, by Michael Locke, John Pratt and Tyrrell Burgess, published by Croom Helm, 34 Sandilands, Croydon, CRO 5DB, £12.95.



Installed as chancellor of the University of East Anglia last week, Professor Owen Chadwick (left) bridged two cultures as the outgoing president of the British Academy, when he conferred the honorary degree of doctor of science on the president of the Royal Society, Sir Andrew Huxley.

Labour authority seeks compulsory redundancies

by David Jobbins

Up to 10 lecturers in the maritime department of the South Glamorgan Institute of Higher Education face compulsory redundancy following a decision by the Labour-controlled county education authority.

The committee, meeting in emergency session this week, took the decision to recommend compulsory redundancy for the nine lecturers and an academic registrar to the full county council.

Lecturers at the institute's Llandfall site, where the department is located, took immediate industrial action, with a walk-out as soon as the decision was learned. Members of the National Association of Teachers in Further and Higher Education at three of the institute's four sites later staged a half-day strike and more action is planned.

OU steps into master's market

The Open University is to offer a diploma in management to students of its Open Business School, as a first step towards the introduction of a master's degree.

Awarded on successful completion of 840 hours study, the diploma entails work on three compulsory courses and a final project.

The three compulsory diploma courses are: The effective manager, Accounting and finance for managers, and a new course, Marketing in action, which begins in October.

The effective manager course has already won recognition from the Institute of Personnel Management and carries exemption from the first stage of the institute's professional qualification.

Other courses offered by the Open Business School include Personnel selection and interviewing, and International marketing.

College lecturers divided over package

continued from front page

generous class contact hours. And the employers regard the concession as a preliminary to introducing a single professional salary grade from September 1986 with common class contact of 20.5 hours a week compared with the average for L1s and L2s of 20.1.

It is the extra class contact hours and other methods of recovering the cost of the package which will produce most dissent. Also suggested is a "super-session" of local agreements on remission of teaching hours by a new national agreement giving tighter control, an attempt to reduce systematic overtime by full-time lecturers, and exclusion of refreshment breaks from class contact hours.

Some members of the executive of the National Association of Teachers in Further and Higher Education feel that acceptance of any of these elements would be in breach of this year's conference decision against

trading off conditions of service. Sources suggest the executive is divided almost exactly down the middle, but draw attention to last year's rejection by the wider membership of a similar package after it had been endorsed by union negotiators.

The two sides are to resume talks on Monday with the possibility of a full meeting of the committee later that day when union leaders will seek clarification of the management's precise aims. The outcome could substantially affect the result of the Naffte executive which has been called for Tuesday.

Union leaders are already drawing up plans for selective strikes and disruption for the autumn.

Naffte general secretary Mr Peter Dawson said: "We have received an offer which moves beyond the discarded 4 per cent and makes a number of positive proposals. At the same time there are obviously elements causing concern but we have something to negotiate about."

DON'S DIARY

WEDNESDAY

Boarding the British Airways flight to Cairo we realize that after months of planning, our trip to Egypt is a reality. Our main objective is to consolidate links between our own college and five Egyptian institutions of higher education. Despite all our efforts to confirm arrangements in advance, at the point of leaving London we are still far from sure what awaits us.

At Cairo airport we are greeted by the reassuring and familiar figure of the President of Sadat Academy. A warm reunion takes place in the VIP lounge and we relax.

Meanwhile, at customs we are posted as missing. The travel company representative can't find us. Confusion ensues but at last we book in at our hotel. The accommodation is excellent and commands an impressive view of the Nile.

THURSDAY

We are received very cordially by the Vice President for Graduate Studies and Research at Cairo University and talk with a number of deans in areas of common interest. We are looking for postgraduate and post-doctoral research students, mainly in health care, social work, food and related disciplines.

Our hosts show us round the campus, library and teaching rooms. We are informed about staff development in the university through the Centre for Educational Studies and Research. It is clear that there are considerable opportunities for our college to assist Cairo with its ambitious staff development programme. Such opportunities will be to the mutual benefit of both institutions. We are impressed by the bright, eager and friendly students, contrasting markedly with the dusty antiquity of their surroundings. Available money is spent on staff salaries, library and equipment - the maintenance of buildings and accommodation is not considered a priority.

FRIDAY

A 4.00am call. Egypt Air to Luxor. The flight is due to leave at 6.30am but it takes off at 7.00am. After an abortive attempt to land we circle the airport for another approach. The final touchdown is greeted with general applause and relief all round. We make a brief excursion to the tombs of upper Egypt in the valley of the Kings and Queens. The tomb of Tutankhamun and of Horemnes, the Colossi of Memnon and the mortuary temple of Queen Hatshepsut.

SATURDAY

Another early call - 4.15am. It is still dark. Two roosters vie with the waiting call to early morning prayers. Families stir, dogs bark, bullfrogs croak from the banks of the Nile. The 5.15am train is scheduled to take 12 hours for 450 miles journey to Cairo. The carriage is air conditioned and comfortable but needs a good clean (maintenance is not a priority). We are intending to get off at El Minya to visit the university. Someone will meet us at the station.

A kaleidoscope of Egyptian rural life unfolds as we slowly make our way north. The railway follows the rich Nile, the endless sugar cane, wheat, citrus fruit and vegetables, further north. Irrigation channels and ditches are everywhere carrying water to a green strip five to 10 miles on each side of the Nile. We see long-robed peasants (fellahs) using ancient water-lifting devices: astiride bicycles, camels, and going about their business in villages and small towns where conditions appear extremely primitive. Our visit to Egypt has been enriched by this memorable image of rural life.

Geoffrey Richardson
Robert Chalmers

Dr Richardson is the Principal of the Queen's College, Glasgow, and Dr Chalmers is the Vice Principal.

We eventually arrive safely at El Minya and the president receives us most warmly despite our lateness. Over our meal we talk about mutual collaborations in food science and health care. We already have links at post-doctoral level and they wish to extend this. Our visit has been cut short and the president invites us to return and spend more time with his staff in the future.

SUNDAY

We are under the impression that we are going to Helwan University at Helwan which is some distance south of Cairo. Communications were addressed to the president of the university but no confirmation received. Discussion of the matter with the British Council early on Sunday morning resulted in an invitation to the Faculty of Commerce which is an outpost of the university of Cairo. However, because we are not expected, nothing has been arranged. The dean takes the matter in hand and in a busy office with constant interruptions, negotiates a programme for us.

The visit to the Faculty of Tourism and Hotel Management, also located in Cairo, proves very worthwhile. We put together the outline of a pilot scheme for a hotel placement exchange involving two Scottish catering students and two Egyptians.

The difficult question of the provision of suitable accommodation for our students in Cairo is to some extent solved because the faculty has a hotel facility which is part of the university. We had an unfortunate experience last year with a group of our students staying in substandard accommodation in another Egyptian university.

We also agree to interview four catering students wishing to do MSc/PhD programmes on Monday evening. Later we meet professors in health care and food sciences from Cairo University to discuss possibilities of post-doctoral research.

MONDAY

We prefer to draw a veil over Monday. A very full programme has been arranged for Zagazig University. To say that we are indisposed would be an understatement. However, by the evening it was possible for us to meet the four excellent students. They are clearly excellent products of the Egyptian system, hard working and enthusiastic young men. Some of the students have considerable potential and we invite them to submit formal applications.

TUESDAY

We visit Sadat Academy of Management Sciences. The academy has about the same number of full-time students as the Queen's College, Glasgow, and a very large part-time student population. We have common interests in management studies, computer applications and hotel management and our links have so far resulted in cultural exchanges of students and staff.

After lunch we have meetings at the academy. The postgraduate centre in Cairo with its 147-bed room residential centre still under construction is a modern building with some of the best provision of equipment and library stock we have seen. There is tremendous pride and enthusiasm among the staff for the work of the academy. We discuss research projects for the faculty in the hotel and computing areas, possibilities of post-doctoral studies and further student exchanges.

As we drive back to the hotel we realize that we have managed to achieve our objective. We have a much better understanding of the considerable opportunities for collaboration between our college and the Egyptian institutions.

We have also had a valuable insight into the Egyptian society and its history. Back in the hotel we take a last look out at the Cairo skyline by night. The lights, the roar of the traffic, the incessant honking of horns. Another early (5.15am) start awaits us to catch the British Airways flight back.

Stick to the facts, says Joseph

Karen Gold and Peter Scott at this week's Green Paper conference



AFTER THE GREEN PAPER

Allegations that the Government has undervalued higher education or regarded it as narrowly vocational were the fantasies of critics and had no basis in fact, Secretary of State for Education and Science Sir Keith Joseph said in his first public defence outside the Commons of the Green Paper on higher education.

The Government should not be accused of failing to appreciate the importance of higher education because we insist on quality and on the careful use of scarce resources," said Sir Keith, speaking at a Green Paper conference organized by the Society for Research into Higher Education and THE S.

There had been a communication gap between the Government and the public since the Green Paper came out, he said, implying that in some cases the Government's intentions had been deliberately misconstrued or distorted.

"I put it to you that wilful misrepresentation is contrary to all the traditions of scholarship. It is incumbent on anyone who takes part in public debate to give serious attention to what is said by other responsible participants," said Sir Keith.

Not only did his past speeches give

evidence of his personal commitment to the power of ideas, teaching and scholarship, but those who were genuinely interested in what the Government believed would have found those commitments in the Green Paper, he

In danger of being crushed by itchy feet

"We have gathered today to bury the Green Paper not to praise it," Mr Maurice Shock, chairman of the Committee of Vice Chancellors and Principals, told the conference in an outspoken attack on Government policy for higher education.

He said that the Department of Education and Science had given itself an impossible task in drawing up the Green Paper. The route taken by the Robbins report and the 1972 White Paper, *Education: A Framework for Expansion*, which would have required the careful statement of objectives, had been ruled out. The Green Paper's endorsement of the Robbins objectives strained credulity.

Nor was the DES able to admit openly that its higher education was "simply a pendant of the Government's policy on public expenditure." Such an admission would have required a detailed analysis of options.

Mr Shock went on to criticize what he called "an itchiness in Government," the constant desire to move on to something new. The combined effect of this itchiness with constant uncertainty about funding was having a most damaging effect on the universities.

He pointed out that the universities had been cut by 17 per cent more than public expenditure generally and that universities were already doing many of the things urged in the Green Paper.

"The attitude demonstrated in the Green Paper is rather like that of someone who has been given both front and back door keys but still insists on making a burglar's entry up the stack and in through the bathroom window," he said.

Dr Harry Law, chairman of the Committee of Directors of Polytechnics, told the conference that he had grave doubts about the ability of polytechnics to maintain academic standards with present low levels of funding.

He added: "Access is fine. But access to what? It is the 'what' that is

preoccupying me." Parity of esteem between university and non-university sectors seemed to have long since ceased to be part of the DES's vocabulary.

Dr Law defended the role of humanities in polytechnics. He said that their presence was important in institutions devoted to science, engineering and business because of the breadth they offered. Humanities students in polytechnics enjoyed good employment rates.

The Green Paper's acceptance of the new "ability to benefit" principle on access suggested by the UGC and the NAB was hedged around with powerful caveats that conflicted with its spirit.

A failure in foresight

The Green Paper recognizes the importance of access and continuing education but fails to carry through its generous principles into projections for future demand, said Mr Christopher Ball, chairman of the National Advisory Body board.

The Government would be wrong to reject the advice both of the NAB and the University Grants Committee on planning for the higher proportion of student numbers, he said. It had to remember that student demand was not a natural phenomenon like rain, but was managed by factors such as higher school standards or youth unemployment.

The Government's acceptance of the principle of extending the Robbins principle and access to all those with "ability and benefit" was warmly welcomed. But Mr Ball went on to attack the Green Paper for its failure to plan the future system of higher education.

It did little to restore morale on either side of the binary line. It did not provide a coherent institutional policy, nor policies on the size, range of work, distribution and categorization of institutions. It did not address the issue of integrated planning of higher education and links between the NAB and the UGC. It did not look at student distribution between sectors.

Groups recommend a variety of therapies

We must be prepared to drop standards in higher education in order to keep the highest standards for some and to provide opportunity within a mass system of post-school education, Professor A. H. Halsey, fellow of Nuffield College, Oxford, told the conference. Professor Halsey chaired a discussion group on the Government's strategy.

Mr Alf Morris, acting director of the Polytechnic of South Bank, who chaired the group on finance, said that it was unrealistic to expect more distant planning horizons. Industry which took just as long to develop new products had to live with uncertainty.

The Green Paper's view that continuing education must be self-financing was "Friedmanism carried to a ridiculous extent," insisted Dr Oliver Fulton of Lancaster University, who chaired the group on access and continuing education. There was a strong public as well as private interest in the

development of continuing education.

Too much faith was placed in detailed projections of future student numbers, argued Professor Gareth Williams of the University of London Institute of Education. Robbins's projections had been exceeded by more than a third in the 1960s and the 1972 White Paper's projections proved to be overestimates by an equal amount.

Professor Keith Clayton of the University of East Anglia, who chaired the research group, said that too much was made of the organic links between teaching and research, although teaching did help to stop people going off the rails.

Vice chancellors have to create a managerial environment in which excellence flourishes and mediocrity withers and dies, argued Professor John Sizer of Loughborough University and a member of the UGC, who chaired the group on institutions and management.

said, quoting passages which he thought the Government valued the and humanities.

"The Government have in years and I specifically - been subject to torrents of abuse for our philistinism," he said. "The Green Paper was headlined 'Commitment to culture' and having itself a philistine," he said. "The Green Paper is naive."

"But what precisely is naive? The assertion that unless the economy is performing satisfactorily it will be possible to devote adequate resources to higher education, that higher education has a role to play through the conduct and education of a search and the education of a qualified manpower, and that it need therefore appropriate to stress a formance of that role if we are to be able more readily to afford much value?"

There was no incompatibility and dichotomy between recognizing and valuing the humanities' contribution to culture and to the training of the mind," he said. "The Government was only talking about change of emphasis."

On access, he said the Government believed, like Robbins, that the should be competition for places in higher education in order to generate "the necessary competence, motivation and maturity". There was certainly a record number of students in higher education, but the Government was standing by its choice of the variant Y in predicting future numbers.

But that prediction could be revised, and the Government was asking the higher education should be able to respond to greater demands created by the Better Schools policies.

Sir Keith confirmed that there would be a White Paper on higher education next year.

The present distribution of higher education between institutions was by no means rationalization, he said. The cry of "You've never had it bad - it's getting worse" (quoting from a THE S editorial) was "the cry of those who believe that the higher education is an easy living and who have no regard for the economic realities", he said.

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Stern warning of foreign 'corruption'

by David Jobbins

Senior academics were warned this week against "creeping commercialism" in their institutions' overseas student policies. Professor Peter Williams, director of the Commonwealth Secretariat's higher education unit said there was a real danger that institutions could become subordinated by financial considerations.

He told the annual conference of the UK Council on Overseas Student Affairs that universities and polytechnics should not be heavily penalized under the financial arrangements for accepting overseas students. This was demonstrated by the greater recruiting activity overseas by universities, who kept the fee income, than by polytechnics, who returned it to their local education authority.

"The cries of outrage from British vice chancellors about discrimination against overseas students and then against charging them the full cost have turned into scarcely audible whimpers," Professor Williams said.

"I have the impression that internationalism is extremely low in the priorities of today's academic leadership. Minds are understandably preoccupied with issues of tenure, keeping the library operating and satisfying the University Grants Committee or National Advisory Body inspectorial teams that institutions are cost effective."

"It is certainly not entirely their fault that they have to live in a system where they must charge full cost fees and weigh the costs and benefits of each programme. But they must be aware of the commercialism that so easily creeps into higher education and which can be corrupting and breed cynicism."

If commercialism did become "rampant", it was for Government and

bodies such as UKCOSA to monitor whether students were receiving value for money and that standards were not being eroded in the attempt to attract fee income from overseas," he said.

This theme was endorsed by the Foreign and Commonwealth Office in a background document for the conference spelling out the need to ensure "satisfied clients" and avoid non-academic considerations which could sour a relationship such as insensitive immigration controls, inadequate accommodation and lack of counselling.

The FCO believes that overseas students should be given greater opportunities to meet and perhaps to stay with British families, and that despite the attractions of other countries they are likely to continue to want to come to the UK because of the high value placed on its educational qualifications.

But Professor Williams pointed to an increasing blurring of the distinction between students and receivers of overseas students, with the possibility of India, Singapore, Thailand, the Philippines, Indonesia, Sri Lanka and Korea becoming important hosts.

Evidence of the British Council's underlying anxiety about existing policies came in a further background document questioning whether clearer government guidelines were necessary.

"A car manufacturer does not ask for anything more of its customers than a cheque which will not bounce while the Government's role is limited to ensuring that the vehicle is roadworthy. Neither ask if a car is appropriate or whether it is sold to the right people. There is a sense in which the suppliers of higher education for the overseas student are being required to adopt the same sort of market ethic."

Counselling 'a success'

The British Council is keen to expand its education counselling service designed to attract overseas students to British universities and polytechnics.

Although firm conclusions will have to wait until final figures for the first year are available in the autumn, the council says in its annual report that there is already evidence from 1984/85 that students who would not otherwise have applied to Britain have been attracted through it.

More than 6,000 have used the service, with 1,000 firm applications from the three countries involved -

Hong Kong, Malaysia and Singapore.

It estimates that there will be a total of 1,200 applications for 1985/86 resulting in about 800 firm acceptances. Fee income would total £7.7 million against an investment of £380,000 in the service by 72 subscribing universities and polytechnics.

The council wants to expand the scheme to other Far East countries, especially Indonesia. Others where market research has found evidence of potential are Brunel, Korea and Thailand.

Adult lobby fights to stay in Unesco

by Felicity Jones and Maggie Richards

University continuing education academics are planning to lobby the Government to change its policy on withdrawal from Unesco.

The Standing Conference on University Teaching and Research on the Education of Adults held at Sheffield University plans to write to Mr Timothy Raison, Minister for Overseas Development, asking for more time to be given for reforms to be made within the United Nations Educational, Scientific and Cultural Organization.

The Government is considering withdrawing on grounds of alleged politicization and has given until December for the reforms to be introduced. Adult educators are divided over the extent of those reforms required; though most believe too much money is spent on bureaucracy.

Mr Arthur Scott, SCUTREA treasurer, said: "It is disgraceful that more than 50 per cent of Unesco funds should be spent at headquarters, and there will need to be considerable reforms. But we think it should be given reasonable time to put its house

in order and we should not adopt a walk-out policy."

Unesco has played a major role in comparative study in adult education and done work in literacy and basic education in developing countries and on integrated rural education programmes.

SCUTREA hopes the letter could help towards swaying official thinking before October's Unesco conference, when it is hoped that a radical strategy of reforms will be presented.

The conference heard Mr John Stoddart, principal of Sheffield City Polytechnic, say that large numbers of adult students were going to be generated by the need to keep up-to-date with technological change.

"The Department of Education and Science projections grossly underestimate this demand," he said. "They assume that the mature initial entrants to higher education are drawn from suitably qualified persons who do not take full-time education when under 21."

"Yet we all know that significant numbers of mature entrants enter without formal qualifications."

Mr Stoddart said that the country

Hot rocks put to the test



Dr Batchelor at the first exploratory drilling

by Graham Smith

Scientists at the Cornborne School of Mines geothermal project at Long Down, Cornwall, hope to start pumping water through their "hot rocks" today following last week's successful attempt to crack the granite more than a mile below the earth's surface.

Project director Dr Tony Batchelor said the 11-year trial, which began as a student research project, were nearly at an end.

"Last week's work was crucial, make-or-break stuff," he said. "It seems to have gone OK and we'll know in a day or two if we are able to produce steam by pumping water through the system, using the natural

heat of the rocks." Three bore holes, each more than a mile deep, were linked by pumping 5,700 tonnes of a chemical gel at a rate of 12 tonnes a minute to crack the granite along its natural fault lines. "We've been waiting for the gel to disintegrate before we pump water through the system," said Dr Batchelor. "The idea is to produce enough hot water to drive a small power station."

The project is funded by Government and EEC grants to research renewable energy sources. In 1984/85 it won £4.6 million of the Department of Energy's total £14 million research budget. Funding is due to end in September 1986.

Japanese in Geordieland

A Newcastle schoolmaster has bequeathed a unique collection of Japanese books and journals to the city's university to found a new library of Japanese science and technology.

Mr Robert Philpott, who graduated from the same university in chemistry in the early 1960s, has been collecting Japanese publications ever since, and now owns over 3,000 titles, together with journals, annual reports of institutions and profiles of major Japanese companies.

He ran the collection from a rented room in Whitley Bay, but has now deposited the whole library with the university, where it will have more space to expand. Newcastle University hopes it will be used by Japanese companies based in the North-east as well as by resident and visiting scholars.

The Government's view of Unesco was also outlined on Monday by Mr Raison, addressing a meeting at the House of Commons.

If British membership were to continue, an assurance was needed that programmes were offering better value for money, were less politicized, more prudently controlled financially and managed more efficiently.

MSC sponsors update

Updating materials for technicians and technician engineers in industry are to be produced as part of a £500,000 development programme sponsored by the Manpower Services Commission.

The Open Tech will provide learning materials for the project, which will begin in March next year. It is being undertaken by the MSC in conjunction with the Institution of Electrical and Electronics Incorporated Engineers.

Shock waves and alarms

Retiring chairman of the Committee of Vice Chancellors and Principals Mr Maurice Shock made a rather too hasty departure last week from a seminar on lecturer training at London University's Institute of Education. Having made his contribution, he and CVC-P secretary Brian Taylor left through a door marked "Fire Exit. Do Not Use This Door". The meeting was then adjourned for 10 minutes until the fire alarm could be switched off.

After eight years among ordinary universities, Mr Shock is to return to Oxford to take up the rectorship of Lincoln College.

Student Affairs wires crossed

In cosmopolitan downtown West-horpe Grove, London, the United Kingdom Council for Overseas Student Affairs found its two out-only telephone lines jammed with incoming calls of a somewhat personal nature.

British Telecom had managed to allocate the council both the numbers previously belonging to a message service, whose former clients were importing the council at the rate of 20 calls a day. The numbers have now been changed.

No wonder teacher training departments feel confused. During recent inspections by the Council for the Accreditation of Teacher Education, CATE member and Worcester College of Higher Education principal Dr David Shadbolt refused to discuss the teaching of any real subject lest his intentions be misconstrued. To keep the conversation hypothetical, he insisted on debating the ins and outs of teaching Euryscan Pottery.

Bad manner from heaven

When Princeton University held its 238th commencement ceremony outdoors under threatening skies, the assistant dean wound up her invocation with a prayer. "Please, dear God," she said, "hold the rain."

The Almighty obliged. But there was a price to pay. An aircraft took advantage of the clearing weather to buzz the ceremony and shower the participants with extremely rude leaflets. Though they said nothing about the Supreme Court decision to separate religion from education, the moral seems perfectly clear: God is on the side of the First Amendment.

PCL reopens Libyan talks

The Libyan fiasco at the Polytechnic of Central London could have been much worse. The original plans, eventually dropped in 1982, were for nothing as uncontroversial as ONDs in Malta, but were for PCL to run a London symposium on Colonel Gaddafi's Third Universal Theory, or Green Book.

But now, undeterred by losing hundreds of thousands of pounds in Malta and a singularly unwelcoming attitude to Libyan students on the part of the British government, PCL is currently talking to the Libyans about another set of courses for them, in London.

Not the Good Food Guide, but a highlight from a prelin exam English essay: "The playwright Christopher Marlowe died after a fricassee in Deptford Tavern". Just to prove it really is the end of term, Antithesis offers a bottle of wine to the best of this year's crop of exam howlers (no old favourites please); to reach its office by Monday July 22.

NERC geology row erupts

by Jon Turney
Science Correspondent

The Natural Environment Research Council has come under fire from heads of university geology departments just two weeks after unprecedented criticism in a report on the council's work in the earth sciences from the Royal Society.

A paper prepared by the committee of heads of university geology departments earlier this year, and released this week, says they are deeply concerned about the council's new corporate plan, which introduces a new level of administration in a council which has always been more bureaucratic than the other four research councils.

The paper, sent to the chairman of the Advisory Board for the Research Councils, Sir David Phillips, says deficiencies in the internal management of the NERC led to a series of resignations of distinguished geologists from the council.

The resignations included Professor John Sutton of Imperial College, London and, more recently Professor John Dewey of Durham University - who

quit in protest at the corporate plan. Professor Michael Audley-Charles of University College, London, chairman of the heads of departments committee, says the influence of geological scientists on the NERC is far below the proportion of NERC support for the geological sciences.

And the committee's paper to Sir David Phillips questions the division of NERC science into three areas, to be overseen by new "directors of science". The committee also expresses concern at the financial pressures on the British Geological Survey.

The committee has had no reply to its criticisms from the ABRC, but may meet Mr Hugh Fish, the NERC chairman. However, Mr Fish has so far declined to meet the committee with-out council officers, and the committee insists on seeing him alone, so no date has been fixed.

Further criticism of the council came this week over its decision to transfer the holdings of the Culture Centre for Algae and Protozoa from its present location in Cambridge to two other

NERC sites - the Freshwater Biological Association in the Lake District and the Scottish Marine Biological Association at Oban.

Microbiologists have been lobbying the council strongly to maintain the collection at one site, in spite of declining use of the cultures after an increase in customer charges last year. Dr Barbara Kirsop, president of the World Federation of Culture Collections, says the Cambridge collection, which keeps 2,000 species, was vitally important internationally. "We are very concerned that if it is split up it will just wither away and die," she said.

Dr Kirsop said the split was ill-timed as algae were just becoming interesting industrially, and a number of official committees concerned with biotechnology had urged the council not to put the collection at risk.

The council says the transfer is to bring the collection closer to active research workers who use algae, and that the FBA and SMBA "will enhance the prospects for their further development and application".

Scotland 'in danger of losing degrees'

by Olga Wojtas
Scottish Correspondent

Scottish degrees could be at risk through further university rationalization, the principal of Glasgow University has warned.

Sir Alwyn Williams, speaking at a degree ceremony, said rationalization posed a grave threat unless it was conducted with more understanding of the Scottish educational system as a whole than had been evident in recent Whitehall pronouncements.

A range of minority interests in the sciences and especially in the arts could well end up being concentrated in a few universities, said Sir Alwyn, and in the British context it would be inappropriate if these were "exclusively located in the great population centres of England".

But Scottish school-leavers had been taught in an entirely different secondary education system and should not be obliged to look beyond the border for training, he said. "The historic links between secondary and tertiary education in Scotland are of a radical, curricular nature and are too important to be broken by bureaucratically-imposed economies."

Last year 94 per cent of all Scottish school-leavers entering degree courses sought to do so in Scottish higher education institutions, he added.

Scottish students were admitted to faculties, not departments, and could have the opportunity to study more than 200 different combinations of courses. This extraordinary range of academic opportunity was in keeping with the broadly-based qualifications which Scottish school leavers attained.

Glasgow University court had stressed the fundamental differences between the Scottish and Anglo-Welsh education systems in 1981, and had urged co-operation among the eight Scottish universities to ensure a full range of degree courses. Scotland's educational needs had to be proclaimed once again as the universities embarked on a second round of economies which would further reduce the degree options of individual institu-

tions, said Sir Alwyn. The principal of Aberdeen University has condemned the Government's Green Paper as "admirable" for ignoring the committee on university management. Professor George McNicol said in a graduation address that the report had warned that any policy which diminished the role and status of the universities would damage the country's educational, cultural and industrial life.

Universities were immensely important national assets, and there would be serious consequences if excellence ceased to be the objective, if they were deprived of the ability to pursue it.

There was a painful contrast between these views and the surprising ineptitude of the Green Paper, which was intellectually well on the way to the bankruptcy court, said Professor McNicol. Despite its lengthy pretensions, it contained "a mish-mash of platitudes, whose implications have been quite inadequately thought through".

Its "almost total disregard" for arts and social sciences was "a most disturbing manifestation of philistinism in high places", said the principal, adding that he had little enthusiasm for seeing the university engaged in producing wealth to support an undisciplined society.

Professor Samuel Thomson, director of Glasgow University's chemical laboratories, also attacked the Green Paper for being without vision and a sense of purpose. In a graduation speech, Professor Thomson said it contained a blueprint for the university of the future.

"Its walls will be made of paper bricks fabricated from the mounds of reports, surveys and forecasts created by the Green Paper. It will have halls of residence so spartan and frugal that they will be fit only for survival training of marines: its cut-price staff, who take a reduction in pay each year, will serve on two faculties, those of cost-cutting and cost-effectiveness," he said.

Ethnic survey hits snag

A union survey on career prospects for black teachers has run into difficulties because of the small number of college lecturers who have said they are from ethnic minorities.

The 70,000 member National Association of Teachers in Further and Higher Education is one of the first unions to venture into the contentious area of ethnic monitoring of its members.

And the one clear fact to emerge from its survey is that only a tiny fraction of college lecturers who belong to the union are non-white.

A pilot study produced a 47 per cent response rate, but out of about 3,400 returns only 38 were from lecturers declaring themselves members of ethnic minorities.

The consultants who carried out the study and the union agreed that this

was too small a group from which to draw reliable conclusions on career development and promotion among black teachers.

So the union's 770 branches were circulated to extend the sample to the entire membership. Officials admit that this was a less than scientific approach with little or no way of monitoring the extent to which branches carried out the request.

But it produced on a further 110 individuals, bringing the total discovered to barely 0.2 per cent of the total membership.

This is likely to be an underestimate of the proportion among the union's membership. Some members will have elected not to declare themselves as being in an ethnic minority group as ideological grounds, or felt that it was not Naff's business to find out.

THE TIMES HIGHER EDUCATION SUPPLEMENT 12.7.85

Academics must learn business skills

by Peter Aspden

Academic staff in universities should receive training in management techniques, entrepreneurship, marketing methods, and media presentation, in addition to improving their more traditional teaching skills, urges a report presented to the Committee of Vice Chancellors and Principals.

The report follows a national survey on academic staff training in universities, which shows that although there is sufficient expertise in institutions to meet training needs, opportunities are lost because of various "organizational constraints".

These include the low priority and lack of support given to training within institutions, timetabling difficulties, poor rewards and incentives, and the lack of specific funding for training purposes.

The report, prepared by Dr George Brown, the CVP national coordinator of academic staff training, also commented on the limited scope of current training, which is focused directly on pedagogic techniques.

Wider aspects such as the organization of departmental reviews, the development of consultancy and entrepreneurial skills, the management of research projects and the writing of research

papers were virtually neglected.

Mr Maurice Shock, CVP chairman, acknowledges the influence on the training report of the recent Jarratt committee on efficiency in universities. Speaking at a one-day seminar on staff training held in London last week, he said: "Heads of departments should be both managers and academic teachers and need appropriate training in management techniques."

But he emphasized that the CVP did not see its role as a national provider of senior management courses, stresses it was up to individual universities to respond to the Jarratt

recommendations. Mr Shock applauded the intention of the CVP committee on university teaching to produce a code of practice on academic staff training for all universities.

But the National Union of Students representative at the seminar, Mr Geoff Ferres, reacted sceptically to the proposal. He said: "The challenge facing university education in the last 15 years of this century is an enormous one. A great burden will be borne by teaching staff and, without a gigantic increase in academic staff training programmes, it is hard to believe they will be capable of shouldering it."

Brussels blueprint for Europe research links

by Jon Turney
Science Correspondent

The European Commission has released details of its latest plans for collaborative research, including possible projects in information technology and biotechnology, new materials, space science and transport.

The proposals were outlined in a document tabled before the European summit meeting in Milan two weeks ago and will be an important input into a follow-up meeting in Paris next week, which will discuss the shape of future joint projects.

The plan by the Brussels-based commission is a response to a separate proposal from France for a new administrative framework for fresh European research initiatives. One reason for the French proposal, known as Euro-1, is to bypass the often cumbersome decision-making of the commission bureaucracy.

The response from Brussels is a 40-page paper outlining the indispensable role of the European community in translating common interests in research and industrial development into new programmes.

In the face of concern over the competitive position of European firms in high technology industry and the potential impact of the American strategic defence initiative on Euro-

pean research priorities, the commission stresses that "the community's R&D instruments are immediately available and can be adapted to the needs of different projects in view of the urgency of the action required".

And the document urges an increase in the share of the European community's budget spent on research. It does not specify how large the increase should be, but goes on to list detailed examples of new research ventures which should be promoted in Europe.

These include new central scientific facilities, such as an advanced wind-tunnel and new radiation sources like the UK synchrotron radiation source, possibly managed in the same way as the existing jet project for fusion power in Oxfordshire. And the paper goes on to propose new work in silicon chip fabrication, artificial intelligence, biotechnology and agriculture and lasers.

But the Paris meeting is not likely to produce great enthusiasm for entrusting further work in areas like this to Brussels. The larger European countries, including Britain, are likely to throw their weight behind the idea of a mechanism for new research initiatives which does not mean piloting each new project through the commission, where 10 countries need to agree to each new proposal.

Dental school decision soon

by Olga Wojtas
Scottish Correspondent

The University Grants Committee and Scottish Home and Health Department are to meet at the end of this month to decide the future of Edinburgh University's dental school.

The school, which is attached to Lothian Health Board's dental hospital, suffers from overcrowding and poor facilities which have been criticized for years despite the fact that it is a building dating from 1927 which was upgraded 30 years ago.

Plans to build a new school and hostel in the late 1970s were shelved following a Government report which said too many dental graduates were

being produced.

However, a joint report from the university and the health board to the UGC and Scottish Home and Health Department has rejected the school's closure and has firmly opted for a new building, at a cost of £7,845,000.

There has never been any criticism of the school's work, with the General Dental Council recently reporting that the academic teaching is of high quality despite the poor physical conditions in which clinical teaching is given.

The UGC itself has praised the standard of the school's work. But following a Government decision in 1983 to axe the number of dental undergraduates by 10 per cent

nationally, the UGC has insisted that undergraduate intake at Edinburgh be cut from 55 to 40 annually. However, the report says there should be "enhanced postgraduate activity" with continuing education for dentists.

The UGC and SHHD also asked the university and the health board to investigate the possibility of refurbishing the present buildings, but the report concludes that while this is superficially attractive, it would not be cost effective.

There are only two other dental hospitals in Scotland, in Glasgow and Dundee, with Edinburgh dealing with up to 70 emergency cases daily, and 3,000 referrals annually.

Keele merger 'a disaster'

A merger between Keele University and North Staffordshire Polytechnic would be disastrous, say Keele students.

Three-way talks were announced last week between the university, the polytechnic and Staffordshire education authority on possible collaboration between the two institutions, including "the possibility of amalgamation leading to the creation of a new regional university".

The initiative for the talks came from Keele's vice-chancellor, Dr Brian Fender. A working party is to report in October.

But a statement by Keele students' union said there had been no consultation on the idea. "On whose behalf is Dr Fender, vice-chancellor, speaking?" it asks.

"Amalgamation would be disastrous for both Keele and North Staffs poly. Both institutions have a distinct nature. The merger of two institutions would lead to loss of jobs and doubling

Adult issues put into focus

Issues for the future in adult and continuing education were clearly identified and put firmly on the agenda for further debate this week.

Meeting for the first time as an integral part of the National Association of Teachers in Further and Higher Education, delegates to the union's adult and continuing education conference put up clear signals about the topics they wish to champion in the future. This year's conference at Stoke Rochford Hall marked the launch of the adult education section of Naff, which has emerged from the absorption last year of the separate Association for Adult and Continuing Education.

Through a series of workshop sessions delegates formulated opinions and suggestions for strategies to be put to the union's standing committee on adult and continuing education.

On funding, delegates wanted both national and local pressure to bring about coherent planning. Fears were expressed about the effect of current fragmented and temporary financing

conditions of service of those working with such projects.

Two groups met to consider work with the unemployed. Delegates assessed the Manpower Services Commission input were worried about the siphoning off of funds by local education authorities, and the withdrawal of rate-funded courses with the substitution of MSC provisions.

Each authority should present a strategy for MSC provision with coordinated planning of funding in each area, it was argued.

There was acceptance of the establishment of a national training agency, and recognition that it had become a permanent feature of non-advanced further education.

Another group examining curriculum planning for the unemployed emphasized the importance of staff training, and the difficulties created by short-term funding. The absence of a Naff policy on work with the unemployed was highlighted, and the union's officials urged to establish a working party to address some of the

Newcastle wins self validation

Newcastle Polytechnic will be the next institution to have powers from the Council for National Academic Awards to validate its own courses. Newcastle's "Sheffield-style" agreement will be announced in two weeks, after it has been ratified by the special CNAA committee currently looking at new validation arrangements for institutions.

The Newcastle proposal, which is to be called accreditation, was made to the CNAA 18 months ago, following its successful partnership in a scheme whereby polytechnic and council representatives validated and reviewed courses side by side.

Last month Sheffield City Polytechnic and the CNAA announced the first agreement following the council's decision to seek changes in its charter to allow institutions self-validation while remaining in a system of national peer review. That was the council's response to the report which recommended that some institutions should be completely freed.

The Newcastle arrangement, very close to Sheffield's in inviting CNAA members to attend institutional validation, will also last for a year until the polytechnic's quinquennial institutional review in autumn 1986. By that stage the Government's response on Lindop will be known and the CNAA will have had time to change its charter.

The agreement means Newcastle is likely to receive some money back from the CNAA in order to carry out its own validation, although the responsibility for ensuring quality will still ultimately be the council's.

A letter from the CNAA is likely to go to institutions at the end of this week asking what kind of validation arrangements they would like in the future. Around eight institutions are known to have approached the council



Sir Keith's misguided assertions

When it comes to the subject of student unions, Conservative Party folklore is rich in dark tales, blood curdling reminiscences and spine chilling warnings. The fact that just about all of it is balderdash is neither here nor there - it makes for a good yarn over a G and T and it fills ten and a half inches in a Green Paper.

The recent Green Paper on higher education purported to be a serious study of that sector's development into the 1990s. It was therefore reasonable to assume that the section on students' unions would offer an insight into how Sir Keith Joseph saw the development of institutional democracy through student representation on polytechnic and university committees or the role of students' unions in the wider cultural, social, political and sporting learning experiences of undergraduates.

Like most others in the educational field I was sadly disappointed. The Green Paper merely offers anecdotal evidence to support three misguided assertions.

First, the paper concerns itself with claims of misuse of students' union funds. It sidesteps the fact that unions have a whole series of legal, institutional and self-imposed restrictions on the use of their funds. Isolated examples of breast-beating about the "need to challenge ultra vires" do not convince us, nor should they convince Sir Keith, that widespread abuse is taking place. In our experience students themselves are the first to yell "Tut!" at the slightest hint of ultra vires.

The paper's second assertion is that the clichéd minority run and have access to students' unions. Well Sir Keith, you now seem to contradict yourself.

Those facilities include the freedom to choose whether or not a student uses the union bar, joins a society, attends a union general meeting or exercises his or her right to vote or be a candidate in union elections. Students' unions prescribe minimum levels of democracy - perhaps Government and institutions should take our example.

The third myth committed to print is that there is a growth in the number and use of subnational officers. The paper goes on to recognize that subnational officers are needed to ensure that a union's affairs are well managed.

We can help you out of your dilemma Sir Keith - but to do so we need to see the evidence behind your assertions. Our address should be known to your officials.

But perhaps the most worrying aspect of the Green Paper is the implication that students' unions are in the vanguard of destroying freedom of speech on the campuses and in wider society.

While higher education students' unions are in the forefront of promoting democracy and the right of groups such as students and lecturers to represent themselves and have a say in the way the institution is run.

They are also in the forefront of promoting debate and discussion on academic, social and political issues of the day. We only have one caveat in that process - the freedom of one person should not infringe on the freedom of others. Freedom of speech does not mean the freedom to oppress or defame others.

Students' unions are not a threat to democracy and freedom. What is a threat is when folklore is taken as truth.

Jim Doran

The author is national secretary of the National Union of Students.



Stepping up: these Liverpool Polytechnic design students have won five out of 12 industrial placements offered in a new scheme by the Royal Society of Arts. The placements on the RSA's Young Designers into Industry scheme last year and are jointly funded by the host firms and the Department of Trade and Industry. The winners, all final-year students of the polytechnic's BA textiles/fashion course, are (left to right): Mark Timmins, 23, Jonathan Lopez-Smith, 22, Frances Campbell, 23, Alison Bantock, 20 and Samantha Sykes, 21.

Minister dismisses criticism of two-year training scheme

by Patricia Santinelli

Opposition claims that a two-year Youth Training Scheme is invalidated by two examples of poor schemes were described by the Government as ludicrous this week.

Mr Peter Morrison, employment minister, was replying in a statement to allegations made by Mr John Prescott, shadow employment spokesman, that he was covering up the truth about poor schemes, in particular one run by Trans Promotions Ltd, of Guildford. In spite of my repeated requests to come up with specific instances of poor quality schemes, the Opposition has still managed to come up with only two cases, and to suggest that we should not set up a two-year scheme because of this is ludicrous," Mr Morrison said.

Mr Morrison has yet to give a considered response to Mr Prescott's detailed letter which was also published in the form of an article in this month's *Youthaid* bulletin.

His letter lists the main problems of Trans Promotions Ltd as inadequate training centres, poor facilities, two

number of trainees and inadequate work placements.

Mr Prescott adds in his letter that he understands the Manpower Services Commission was well aware of some of these problems, especially as one of the company's former training officers won his claim for unfair dismissal against Trans Promotions, in March of this year.

But an MSC spokesman said this week that the commission had not been aware of the details. What it did know was that there were some problems with some local schemes, but not nationally and it had dealt with these through normal channels.

Local programme assessors were continuing to monitor the situation and believed the schemes could be brought up to standard, and the company had seemed very willing to remedy matters.

The setting up of the two-year schemes came under attack too at an Institute of Careers Officers conference held in Sheffield.

Mr Mick Farley, Sheffield's senior adviser post-16, said that the scheme's success was threatened by the Govern-

ment's refusal to ensure adequate resources.

"The cash made available by the Government for two years is roughly £1 billion, the amount originally set aside for one year. But the net costs to the Government after receipts from the European Social Fund and savings from non-payment of unemployment benefit is little more than £200 million," Mr Farley said in a 2,000 word letter.

Implementation of the White Paper *Training for Jobs* is one step nearer with the agreement last week by the Association of County Councils to a deal already ratified by the MSC and the Association of Metropolitan Authorities.

The deal gives the MSC financial control over a total programme of courses produced by local authorities and their colleges. The actual amount of funding will be decided nationally in consultation with local authorities each year and be allocated on the basis of student numbers.

The basis of the agreement is that each local authority will produce a three-year rolling development, with the first year of the plan giving course

details which will have been discussed with employers, the TUC and colleges.

Final proposals are expected to be sent to the Government this week but there is some doubt as to employment minister approval as Mr Morrison was known to favour an approach which would have the MSC funding only certain specific courses.

The National Union of Students is asking for a bigger share of representation on the bodies overseeing the YTS, now that it is to become a two-year scheme.

Currently the NUS is represented on the Youth Training Board and on some of the area manpower boards, but now it wants official recognition at all levels.

NUS president Phil Woolles said that if the MSC wanted to take its role as major provider of education and training seriously, it must take account of the view of young people and their representative organizations. The union says it is the recognized representative of some 850,000 students in further education, as well as 100,000 YTS trainees on further education based schemes.

Right-wing checks on US academics

from William Norris

WASHINGTON
Liberal academics in America are about to come under the scrutiny of a conservative watchdog. Claiming that he wants to stop colleges and universities from teaching "disinformation or misinformation", Mr Reed Irvine has formed an organization called Accuracy in Academia which will audit classes and confront faculty members who are conveying information that Mr Irvine and his supporters believe to be incorrect.

Mr Irvine is no stranger to this sort of work. He is the president and founder of Accuracy in Media, Inc. which has a \$1,700,000 annual budget to enable it to monitor the news media and publicize its liberal failings. It is because he believes that many of these arise from the fact that most journalists are taught in college by predominantly liberal faculties, that he has started his latest venture.

Recent campaigns by conservatives and fundamentalist groups in the United States against educators have focused on the primary and secondary schools. Mr Irvine's effort is believed to be the first aimed at higher education. "The idea is to see whether kids on college campuses are being fed disinformation or misinformation," he says. "We will expose what is going on and, by exposing it, we hope to persuade those responsible for it to do something about it."

Mr Irvine makes no secret of his belief that some faculties are not merely liberal in outlook, but possibly Marxist, although from an American right-wing standpoint these terms are virtually synonymous. He aims to set about exposing such radicalism by recruiting retired people who will register in college classes and challenge professors they find passing out "inaccurate" information.

Though the group will also seek the assistance of younger students, Mr Irvine prefers the elderly. Their knowledge, he says, will make them more discerning, and they will be free from the pressure of grades and course requirements.

Few students, according to Mr Irvine, are able to distinguish false from true statements, especially when these come from figures in authority like professors. "It's really a pity for people to take advantage of innocent kids who don't know anything, and feed them a bunch of garbage. Obviously, not all the kids are able to fight back."

Faculty members who offend against Mr Irvine's conservative criteria will be relieved to learn that he does not intend to seek their dismissal. He will merely inform administrators of the teachers who are, in his view, conveying false information. "It's up to the administration if they want a guy on the faculty who is consistently distributing misinformation to students," he says. His prime target will be liberal arts courses, though he has declined to name specific targets among institutions or individuals.

Tenure, he acknowledges, may cause him some problems in his bid to rid the universities of their liberal cancer. Mr Irvine is, predictably, against the whole system. "These guys, they get tenure," he says. "Is that a free-market principle - to guarantee someone that he can do anything he wants and his job is secure for life?" Asked if he wants to stifle academic freedom, Mr Irvine vehemently denies any such aim. "Why should it raise a question about academic freedom?" he asks. "This is an expression of academic freedom and free discussion. If somebody says something that's wrong, people ought to be free to criticize it."

Planck staff reject 'Star Wars' scheme

Some 350 West German scientists have written an open letter to Chancellor Helmut Kohl announcing their refusal to cooperate on the American Strategic Defence Initiative (SDI) or "Star Wars" programme.

The letter, drawn up by a group of scientists at the Max Planck Institute for astro-physics and extra-terrestrial physics, said the SDI programme was qualitatively comparable to a deployment of new intercontinental missiles and dashed all hopes for progress in disarmament.

The scientists said they would make all efforts to make the German public aware of the implications of the scheme. They said they followed the 1957 appeal of a group of nuclear researchers in Göttingen in which the scientists had openly refused any form of cooperation on the development or testing of atomic weapons.

The signatories said they shared the approach of a number of American scientists that the SDI programme would have a destabilizing effect. It would not work as a purely defensive weapon, they noted, but rather increase the chances for a pre-emptive nuclear first strike.

It was "irresponsible" to invest massive financial means and scientific potential into SDI when these were urgently needed to solve problems such as environmental destruction, unemployment and poverty.

"We see monstrous cynicism in the assertion that now weapons have to be developed so that we can remain technologically competitive," the letter said, and added that conflicts could be solved by political means.

Speaking for the government, research minister Heinz Riesenhuber defended the SDI, saying it represented not a threat to mankind but a potential defence against nuclear weapons. He respected the signatories' decision, but the initiative should not be rejected as it was a condition of future disarmament negotiations.

Penalties kick cheats into touch

from William Norris

WASHINGTON
The athletic tail has wagged the academic dog too long. In a sweeping series of reforms which some commentators have described as historic, American university presidents have acted to bring their sports departments under tight control. From now on, cheating is out and integrity is in. At least, that is the theory.

Meeting in New Orleans under the auspices of the National Collegiate Athletic Association, more than 200 college presidents voted overwhelmingly to arm the association with stiffer penalties for those who break the rules - and the penalties are extremely tough.

If an institution found guilty of a major violation in any sport in the last five years commits a new major offence after September 1 - even in a different sport - it will lose some or all of its games for up to two years. A two-year suspension in the major money-making college sports of basketball or football is regarded as the equivalent of a death sentence, since television revenues alone now generate more than \$100 million annually.

Nor will coaches of teams under suspension be able to carry on their trade at another university, for the new

rules say that they will take the suspension with them wherever they go.

So if an institution's basketball team is penalized for a year for a major infraction, for example, and its football team is penalized in 1988, the football team would be barred from competition and the football coaches from coaching for up to two years.

There will be external audits of all funds generated by athletic departments and their supporters' clubs, and a compulsory annual report on the academic qualifications of freshmen who come to university on athletic scholarships. Colleges will also be required to report on the academic progress of those students, and to assess their graduation rates in comparison with other scholars.

The reforms are the work of the 44-man presidents' commission of the NCAA, set up to study the problem a year ago, and come in the wake of a number of highly-publicized scandals in varsity sports. The most recent involved allegations of "points-shaving" by members of Tulane University basketball team, who were said to have been paid in cocaine by bookmakers for deliberately losing games. The team has since been disbanded.

The near-unanimity of decision was largely a result of pressure on university presidents to attend the convention in person, rather than sending representatives of their athletics departments.

There was little debate, most of the details having been agreed behind the scenes beforehand - a fact which led some presidents to complain that they were being railroaded. "It's communism," remarked Otis Singleton, President of the University of Kentucky. "It's just like communism. Nobody votes no."

Communism or not, most delegates seemed happy that they were at last doing something to attack the over-commercialization of college sport which has induced a win at all costs attitude.

Their next problem, to be voted on in January, is the thorny question of testing student athletes for drugs. An NCAA plan calls for the testing of footballers, basketball players and track and field athletes, starting in 1986.

Those found to have been taking drugs would be suspended for 90 days and required to enter a rehabilitation and education programme. The scheme would cost \$500,000 a year to administer, at an estimated \$200 per student per test.

Malay teachers 'victims of political brokers'

by Geoffrey Parkins

Malay teaching unions have complained the education ministry that individual politicians and outside movements are fast becoming the overall directors of the country's universities and schools.

They say they exercise an ever increasing influence over appointments, transfers, disciplinary decisions and the way institutions are run.

The Malay Teaching Union and the National Union of the Teaching Profession claim that outside groups, movements and politicians are becoming the "power brokers" in the appointment, promotion and transfer of heads and teachers, and are continually interfering in educational affairs and overruling the decisions of heads on disciplinary matters.

This is disquieting institutions, said Mr Rajaguru, secretary general of the NUTP. In such an environment institutions have no longer able to function normally, he said.

Outside groups and individuals, the unions say, are going over the heads of institutions and local state education departments to senior officials in the education ministry to get what they want.

For example, senior appointments are normally made after consultation between local state education directors and the ministry, but, in many cases,

say the unions, political meddlers had exerted influence on the ministry directly to secure appointments for their favoured candidates, without even consulting local education departments or university heads. Similar practices were occurring in the appointment, promotion and transfer of teachers.

The Malay Teachers Union said that many heads had been reprimanded and threatened with disciplinary action by the ministry, after taking disciplinary action against students, sometimes before any investigation to establish whether the heads actions were justified.

China adopts new strategy

China has set up an Institute for Strategic Studies which is attached to the Academy of the Chinese People's Liberation Army. The institute will specialize in the study of military, strategic and defence problems, regional and global strategies, the military and strategic policies of the major powers and military theory generally. It will also assist in the Academy's teaching programme.

Two specialists advisers have been engaged by the institute, Zhang Jing who is an associate research fellow at the Institute of American Studies at the London-based Institute for Strategic Studies, and Xue Mouyong, a foreign ministry expert on international affairs.

Funds stranded

While Sri Lankan universities went to complain of a scarcity of research funds, it has transpired that the University of Peradeniya has more than \$60 million unused from grants by foreign donors, including the United Nations specialized agencies such as the World Health Organization, Food and Agriculture Organization of the UN and the UN Department of Agriculture.

The main reason is said to be that those involved in the projects in which grants were made had left the country, and the funds could not be channelled to other projects since they were earmarked for specific projects and, therefore, not transferable. University Grants Commission sources believe the body's hands are tied because the grants have been made directly to the universities.

The need for the meeting house was highlighted a few weeks ago when over 200 people met in the temporary *marae* buildings at a special meeting to mark the second number of Maori graduates from Victoria University this year.

Last year only six graduates but this year 28 graduates were honoured.

Far sighted

A new technique which could revolutionize the construction of large optical telescopes, and drastically reduce their cost, has been tested successfully in Arizona.

Using a furnace mounted on a turntable, melting the glass and allowing centrifugal force to shape the mirror, Dr Roger Angel of the University of Arizona has produced a six-foot diameter mirror with a focal length of six feet. It is one step in a series of trials which Dr Angel hopes will culminate in the production of a lightweight inexpensive mirror about 25 feet in diameter.

Tibetan first

The construction of Tibet's first university, which is to be opened in Lhasa soon, was completed a fortnight ago.

The university building, which cost over 8 million yuan, covers an area of 10,000 square metres, and the institution, which grew out of Tibet Normal College will now be enabled to enrol 1,000 more students this year - 400 more than the combined total of graduates produced by Tibet's three colleges last year.

Peking tests

Peking Teachers' University has this month opened China's first psychological testing centre. The centre has over 40 doctors, professors and other experts who will engage in the testing of intelligence, character and occupational aptitude.

The centre, which will also be a base for broader psychological experimentation, will help social workers and schools identify gifted and handicapped children, advise employers, universities and colleges on student aptitude and suitability for courses and jobs, and help doctors and counsellors in solving mental illness and marital problems.

Four of China's universities now have psychology departments teaching a total 400 students, the largest number for many years - and from this year all teacher trainees will receive psychology classes in China's 80 teacher training colleges.

Spanish minister resigns

by Sarah Jane Evans

The resignation of the Secretary of State for Universities, and the departure of one of her deputies to a different post, marks the end of the Spanish Government's two and a half year honeymoon with higher education.

Education Minister José María Maravall, despite losing his seat on the ruling socialist party's executive at Christmas, has enjoyed a longer period of calm than most of his colleagues, the socialist trade union, for instance, recently called a successful one-day national strike against the Government's proposed social security reforms.

Carmina Virgili Rodon, 57, was one of the few scientists appointed to the education ministry. She had formerly been dean of the geology faculty at Madrid's Complutense University. Her resignation came after internal disagreements in the ministry over the implementation of the wide-ranging law to reform the universities.

This law removed the universities from the control of the ministry and handed over much decision-making to the autonomous regions. It also reorganized the governing bodies of the universities and restructured the system for appointing and giving tenure to academic staff.

The original draft was criticized by several educational advisory institutions and the relevant trade unions as well as by senior members of the ministry, on the grounds that it would be illegal, by invading each university's independence and restoring the ministry interference that the new law had been introduced to remove. This row has been brewing for months since the ruling has taken an exceptionally long time to be passed, as it has been repeatedly redrafted.

Sra Virgili's departure has been followed by that of Emilio Lamo de Espinosa, 38, a sociologist who also taught at the Complutense University. He was director general of university education. In just two and a half years they made considerable advances, including the drafting and implementation of a law that made substantial

changes to a formerly inefficient and cumbersome system. The education ministry's other major innovation, the sweeping law to reform primary and secondary education - the "right to education" law - has yet to be enacted. It has been sitting for nearly a year before the Constitutional Tribunal because of Opposition protests that it is unconstitutional.

Senor Lamo de Espinosa has moved to become Secretary General of the Council of Universities. This is a newly-formed body, as a direct result of the university reform ruling, which bears some resemblance to the UGC, and replaces a council of rectors, which was mainly concerned with assessment.

The new council is intended to be "a permanent forum for discussion about problems in universities." The chair is the minister, and the other members are the rectors of all the state universities, those in charge of university education in the autonomous regions, and 15 other delegates appointed by the Government and the two houses of parliament.

The council will have a clear political function but will also be able to involve itself in the granting of degrees and the structuring of courses, as well as the size and growth of individual universities.

Australians restrict overseas levels

from Geoff Maslen

MELBOURNE
The Australian Government has decided to restrict the intake of foreign students in future years to 1985 levels. This means 3,500 new private overseas students will be able to begin their studies here next year.

Of these, 2,000 will be admitted to secondary schools and 1,500 to higher education institutions. At present, almost 19,000 foreign students are in formal secondary and tertiary courses. There has been growing concern in some higher education quarters about the impact of increasing numbers of foreign students on the places available to Australians. Over the past

three years there has been a surge in applications for enrolment at universities and colleges and thousands of suitably qualified students have been turned away from further study because of the limited number of available places.

In the past, when university departments were short of students they welcomed applications from overseas, but now some departments have large majorities of foreigners and few places for Australians. Announcing the latest decision, the Minister for Education, Senator Susan Ryan, said strict controls over the entry of overseas students were beginning to have an effect so it would now

be possible to maintain the 1985 intake level without exceeding the current number of foreign students in Australian institutions.

Senator Ryan said both overseas and local students would gain from the arrangements. Overseas students themselves, however, are not so sure and they have protested about the limitations.

Entry of secondary level students would be restricted from 1987 to those entering years 11 and 12. Senator Ryan said. A recent inquiry into the problems facing foreign students had found serious difficulties among junior secondary students from other countries.

Icelandic saga nears its ending

from Christopher Follett

COPENHAGEN
Twenty years after a bitter dispute between Denmark and Iceland over the ownership of priceless Icelandic sagas, the University of Copenhagen has returned more than two-thirds to their country of origin.

The sagas have been held by Copenhagen University since 1730, when the Icelandic scholar Arni Magnússon, who held a chair at the university, bequeathed his collection of ancient manuscripts.

A treaty was signed in 1965 between the Danish and Icelandic governments after a long dispute over the ownership. It called for the irrevocable transfer of 1,800 early Icelandic manuscripts and to date, 1,213 have been returned. There are now 600 manuscripts to be processed and the return is expected to be completed on schedule within the next 11 years.

The first consignment of manuscripts, despatched in 1973, comprised works considered quintessential to the Icelandic heritage, such as the *Codex Regius* of the poetic *edda* or *cyclo*, a collection of mythological poems dating in written form from the 13th century, and the *Flateyjarbok*, a formidable canon of prose sagas of the Norwegian kings.

The manuscripts, which relate Scandinavian mythology in old Norse, recount the first settlement of Iceland by the Vikings in the 9th century AD and the history of Icelandic family feuds. They also include the *Saga of Eric the Red* and were written - often by unknown scribes - over a period of 600 years, from the 12th to the 18th centuries.

They are being processed by the Arnamagnæan Institute at Copenhagen University and the project is costing Denmark \$42,000 a year.



Li Peng: special powers

Chinese set up new commission

by Geoffrey Parkins

The Chinese government in Peking has established a new State Education Commission, to replace the former ministry of education. The new commission has been given far greater powers to ensure the effective implementation of the Party Central Committee's education reforms.

The first commission minister Mr Li Peng, who is also China's vice premier, said the commission will, as a comprehensive department of the State Council, have special powers and "exercise leadership over all ministries, provinces, municipalities and autonomous regions" in educational matters, and in the implementation of the new education reforms.

These powers include control over all vocational, adult, television and correspondence education, besides all school and higher education.

The move entails a reshuffle which leaves only two of the former education ministry's senior officials in positions of authority within the new commission. The commission has eight vice-ministers, six of whom are from local governments or educational institutions.

Mr Li said that in broad terms, the main tasks of the commission were to successfully implement the Party Central Committee's reforms, draw up new regulations and laws giving more autonomy to institutions of higher education and to encourage all sectors of society to participate in educational projects.

Another big task mentioned by Mr Li, was that of raising the social and economic status of teachers throughout the country.

There has been speculation that the new commission will exercise control nationally through local education commissions set up in all regions across the country, but Mr Li said specific arrangements would be decided by local governments according to their circumstances and practical conditions.

Swedish innocence abroad

from Donald Fields

HELSINKI

Continental universities have been mercifully spared the Cambridge Apostles and their like, but even without a trace of British-style treason they may become unwitting purveyors of the intelligence used to dislodge pawns in the east-west chess match.

This thought is prompted by news that the University of Lund, southern Sweden, has lent the Soviet authorities books that could give the Red Army unorthodox insights into the disposition of Swedish harbours and airstrips. Cynics might say the information has been collected anyway - notably by intruding submarines - but the implications do extend far beyond a single country.

The university's chief librarian, Mr Nils Palmberg, emphasised that the university was unique in being obliged to lend its material to any applicant, Swedish or foreign. Along with the Stockholm Royal Library it shares the distinction of stocking every volume printed in Sweden.

Nevertheless in a world of cloak-and-dagger espionage, there is much of the pristine, some would say naive, in Lund's conduct. Perhaps it is the ingenuousness of a nation that has not fought a war for 171 years, over half the university's known history.

Since 1982, when the East German naval library extracted its copy of a sensitive Swedish defence periodical, Lund may have provided many nuggets of information generally pounced upon by diplomats. The RIL books borrowed in that time by Soviet institutions - a tiny fraction of all the international traffic - extend to fiction, history and school texts.

However, last winter the university lent the Soviet State Library some parish histories, containing maps and charts with a possible strategic significance. They were quickly returned; Mr Palmberg conjectures that the "photocopying machines of Moscow and Leningrad are no less efficient than ours".

The Swedes themselves borrow a lot of scientific tracts from Soviet libraries, but exchange must not be confused with reciprocity. "Of course they don't supply us with anything containing maps," Mr Palmberg said.

Mr Palmberg is eager to inform the defence staff when an odd request comes from the eastern bloc - or anywhere. So far the military experts have not suggested that any books be withheld, and by law such a procedure would entail governmental approval.



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Open for business

...moured to have saved it. But next week the political visitor to the Open University will not be so benign. On Wednesday the OU confronts its severest critic to date when Sir Keith Joseph steps on to campus.

Having recently taken over direct responsibility for the OU along with other areas of adult and continuing education, the Secretary of State is said to have embarked on the task of examining his new sphere with much zeal.

Last year, at the height of the parliamentary debate about the university's financial crisis, MPs highlighted the fact that Sir Keith had omitted to pay an official visit to Milton Keynes.

In remedying the position, Sir Keith has set himself a demanding schedule of discussions with the OU's most senior academics. In particular he has expressed a wish to scrutinize the second and increasingly important strand of the university's work - its continuing education programme.

In the strictest sense, of course, all work undertaken by the university is continuing education, since it is aimed at all those adults who wish to indulge in education after initial schooling. But there is within the OU a clear division between the undergraduate programme and the output of vocational and more general courses.

The divide is probably now the only remaining legacy of the OU's initial caution about its academic profile. Back in 1969 the university took the view that its first and overriding responsibility was to establish its scholarly credentials through the undergraduate programme. By the mid-1970s, with its academic reputation assured, the OU felt sufficiently secure to embark on production of a limited number of general courses at sub-degree level.

The professional approach: studies in microprocessing (left) and robotics at the Open University

Maggie Richards previews next week's OU visit by Sir Keith Joseph

By the end of the decade, however, it was beginning to visualize the vast potential use of its distance learning techniques for vocational and, in particular, updating purposes.

But as fears about tarnishing the academic record began to recede, a new factor emerged to sustain the gap between undergraduate and continuing education provision. The OU's cash crisis had arrived.

From the outset this had a devastating effect on the continuing education programme. Though the university's intention had been, and remains, the attainment of a balance of work equal to the undergraduate sector, the target

now had to be achieved without any recourse to the university's recurrent grant.

The burden of the "self-financing" strategy still haunts each sector of the continuing education programme, although the university's unceasing efforts to attract external funding have met with some success.

Fee income has increased from £1.2 million four years ago, to a predicted £4.5 million this year. Overall, the OU managed to secure £12 million during the last three years to fund its continuing education budget - monies drawn from fee income, external grants and the now notorious £2.4

million loan from the Department of Education and Science, given under the auspices of PICKUP, the programme of professional, industrial and commercial updating.

The OU's pro-vice chancellor for continuing education, Mr Mike Richardson, believes the university has done its utmost to make the best possible use of its resources.

The major practical problem for continuing education, he contends, is in pricing OU materials competitively, when the university often finds itself in conflict with other institutions which have been able to offer more generous rates on the basis of more advantageous Government funding.

To reinforce its emphasis on wealth generation within the continuing education programme, the university has recognized how vital it is to sell itself effectively.

Recently a new marketing policy has been formulated which will operate in two directions. A marketing manager is to oversee marketing strategies throughout the entire programme, while a sales team under the direction of a newly appointed business development manager will promote various sections of the provision, concentrating mainly on the two most lucrative areas.

The appointments will, it is hoped, mark the beginning of a new era, in which marketing expertise plays a far more major role in determining the direction and style of continuing education output.

A secondary task for the new marketing team will be to restructure the whole image of OU continuing education.

"We need to realign the public perspective of the university as an institution. In addition to being seen as a successful provider of opportunities for undergraduate study we must be viewed as a major training resource," Mr Richardson said.

"Within the university there is now a new awareness of the importance of marketing and selling. Several years ago it was anathema to many people. Now they are applying themselves wholeheartedly to discussion of the issues involved."

Under the terms of the grant, the university is compelled to make the courses as relevant as possible to British industry, and to make access to them as rapid and open as it can.

Three courses are currently on offer - robotics in manufacturing, polymer engineering, and software engineering - and by November several more will be available.

In line with the OU's open access principles, the courses will be made available to all prospective students, but the level of work does assume degree level or equivalent technical knowledge. SATUP's director, Mr Glyn Martin, is confident the courses will be a godsend for many engineers desperate to update their knowledge without endangering their career prospects.

Students completing three core modules plus a further two optional modules will be awarded a diploma. Further project-based work leads to the award of an MSc.

On enrolment, each student is allocated a tutor for 12 months. Most students, it is anticipated, will take about six months to complete the course, but they may sit the examinations up to two years after enrolment.

Each of the SERC courses is expected to have a lifespan of only eight to 10 years, although revision may take place in the interim.

Under the strict self-financing criteria the university applies to continuing education, SATUP will need to generate sufficient funds from its current output to provide new courses for the future.

However, the OU is looking to companies to bear the brunt of the cost of updating, and gambling on its highly competitive rates - about £2,500 compared to about £15,000 for conventional training in these fields.

Courses are not cheap, ranging from £270 to £435, so perhaps the best recommendation for the Open Business School comes from the 900 of its students who thought the own pockets to find the fees.

BRIEFING BRIEFING BRIEFING

Up to date help for industry

This summer the latest batch of new graduates in science and engineering will be entering British industry with high hopes and ambitions for the future.

But within two years they will probably encounter problems in keeping abreast of technology, and the end of four years their knowledge is very likely to be totally out of date. The dilemma for many then will be whether to risk a break in their careers to return to study.

At the Open University, the Science and Technology Updating Programme (SATUP) has been busy developing schemes to accommodate these needs. This early awareness of industry's problems in coping with the ever-quickening pace of change gives from the university's involvement in fundamental microprocessor training.

Five years ago, financed by a grant from the Department of Trade and Industry, the university set out to teach various industrial applications of microprocessors.

Many large companies jumped at the chance to familiarize staff with the latest technology and the scheme became a runaway success, with the course hardware - 2,500 micro-kilobase sold, and an estimated 10,000 students being taught.

For the university, the MicroLab project was vital to demonstrate how distance learning techniques could be used to assist industrial updating, which led to the creation of SATUP.

This year, equipped with a £12 million grant from the Science and Engineering Research Council, SATUP has embarked on its most ambitious project to date - to provide a series of sophisticated updating courses in science and technology fields, which can be taken either individually or as components of an MSc.

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An occasional revolutionary

PROFILE

Peter Scott on the scientific philosophy of Thomas Kuhn

No living philosopher, probably including the much older Sir Karl Popper, is more often quoted and more frequently (and willfully?) misunderstood than Professor Thomas S. Kuhn of the Massachusetts Institute of Technology and author of *The Structure of Scientific Revolutions*.

Kuhn's own five books and 40-odd articles appear an almost modest production beside the mountain of comment, criticism and interpretation of his ideas. A 1980 collection of essays on his work lists in its bibliography 254 items under 11 headings - the philosophy, history and sociology of science, sociology, political science, economics, history, psychology, theology, art and education. Among these scrupulous of Kuhn are many intellectual heavyweights - Putnam, Merton, Bourdieu, Lakatos.

Of course these books and articles are only the visible tip of the Kuhnian iceberg. His ideas have been used and misused by hundreds of scholars and scientists across the world. References and footnotes that evoke his work are everywhere. On some global computerized citation index Kuhn would probably register at the top of the scale.

The Kuhn phenomenon after the fashion of Kuhniana, seem to have a dynamic momentum of their own effectively detached from the actual work and real person of Thomas Kuhn in his modest wooden Second World War building at MIT.

But Kuhn's fame is not all a glorious accident. Maybe because he originally approached philosophy from an odd, "hard" general education, after the fashion of Kuhniana, a paradigm builder and buster rather than a "normal" scholar working within the intellectual examples devised by more creative minds. He has taken grand intellectual risks, and so has rightly won equally grand rewards.

Raised in physics, he moved quickly into the history of science, prompted by the liberal preoccupations of Harvard general education. After the Second World War. But the experience of writing history, in particular the close identification it seemed to establish between the structure of scientific development and the shape of cultural change, encouraged a second shift, this time into the philosophy of science.

The Structure of Scientific Revolutions, still his most famous book, was quickly recognized as a paradigm (in the correct Kuhnian sense of an example or model of successful "problem solution"), so offering a practical demonstration of its central theoretical thesis. The book's successful momentum carried the 40-year-old Kuhn far beyond the restricted frontiers of the philosophy of science.

But Kuhn's influence has been felt most intensely outside his three home disciplines of physics and the history and philosophy of science. The real build-up of Kuhniana has been in social science. His argument that science is validated not by "objective" positivistic norms but by the collective judgement of communities of scientists has appealed particularly to social scientists.

Not only does this description of how knowledge is formed and validated seem to fit social science, but it appears to undermine the superior authority of the natural sciences. So social scientists have seized on Kuhn's ideas as a strategy for getting on equal intellectual terms with "hard" science. Meanwhile in the humanities many have been attracted by Kuhn's dichotomy between the revolutionary breaks of paradigm change and the continuity of "normal" science as a creative metaphor to help describe the diverse phenomena from the rise and fall of empires to the development of musical taste.

Kuhn himself insists that much of his work is "species specific" and so can only be applied to the validation of knowledge in developed sciences like physics and biology. He is alarmed (although temptingly flattered) by their wholesale application to social and human sciences.

Kuhn was born in Cincinnati, Ohio, in 1922 into a German Jewish family that had emigrated to America in the middle of the 19th century. His father came from a banking family, but had trained as an engineer and ended up as an industrial consultant; his mother came from a family of New York lawyers.

The conventional interpretation suggested by such a background, the temptation to emphasize the centuries-

old Jewish tradition of learning, do not really work with Kuhn. Any Talmudic inheritance sits very lightly on him, neither of his parents took much of their Jewishness and Kuhn himself has been true to their secular instincts. There was an uncle who fitted the stereotype of the Jewish scholar rather better but he remained a shadowy background figure in Kuhn's early years.

Yet the examples set by his parents were so important in his intellectual development. From his mother he inherited a taste for the arts. So Kuhn has remained true to both in his own preoccupation with the history and philosophy of science. In particular he traces his first interest in philosophy back to a father who had a first-class mind and nurtured a critical ability in his children by treating them as small adults. So Kuhn had an early apprenticeship in respect for the exact truth.

Kuhn went to Harvard in 1940 and chose to major in physics, then approaching the peak of its intellectual prestige, rather than mathematics which had been his other strong subject back in New York where his family had moved when he was a child. But in a significant pointer to his later development he also decided to attend a freshman course in philosophy, a quick-fire survey of the field that disposed of Plato and Aristotle before Christmas and moved on to Descartes and Spinoza in the spring.

But in 1941 war came to America. Harvard's physics department moved over to military work and Kuhn found himself working on intensely practical problems, such as how to produce foil that would confuse radar. In one of those ironies of time and place Kuhn now works in the very building in MIT two miles down the road where other wartime researchers tried to produce a better short-wave radar, one maybe that would not be deceived by Harvard's foil.

He resumed his interrupted education in the fall of 1945 and completed his degree in physics. But, to anticipate his own later terminology, Kuhn had probably already decided that life as a "normal" physicist was not for him. His interest in the context, philosophical and historical, in which science develops had already been awakened by his first formal contact with philosophy five years before.

The interest was decisively stimulated by postwar development at Harvard. Under Dr James Conant, Harvard in the late 1940s was approaching the climax of one of its periodic, and maybe its most creative, experiments in general education. Under this programme Kuhn was asked by Conant to contribute to his "science" course for non-scientists, a request that a graduate student at the beginning of his academic career would hardly ignore.

In fact what would have been a chore to many of his physics colleagues was a challenge to Kuhn, and his reputation has been fashioned largely from his response to it. His starting point was physics, his own subject, and its ancestor, mechanics. But the inaccessibility of post-Newtonian physics and even of the Newtonian revolution forced him further back in history to find examples of scientific progress that would be comprehensible to non-science undergraduates at Harvard.

His eventual choice was the period of Copernicus and Galileo when ancient and medieval conceptions of the universe were overturned. To have moved still further back in history would have run into another form of inaccessibility, as Kuhn himself had discovered when he read Aristotle's *Physics* as background to Galileo. "I couldn't understand any of it. But then I realized that I was judging it by today's paradigm. By the standards of its history it was very good physics."

This form of incomprehensibility was later to surface in Kuhn's mature work as "incommensurability".

Already Kuhn was assembling many of the key elements out of which he would build his own theories about scientific development - the idea that the shape of scientific ideas is produced, and constrained, by the communities in and through which they are expressed, the insight that for long periods scientific progress is quietly cumulative, punctuated by brief periods of revolutionary change when worlds are turned upside down, scepticism about claims that the development of science is linear and instead a growing suspicion that there are no solid terms in which successive paradigms, Aristotle, Newton, Einstein's physics, can be compared and so no sensible grounds on which they can be ranked into a great chain of progress.

All these elements can be traced back to Kuhn's Harvard years that culminated in his first book *The Copernican Revolution* (although it was only published after he had moved to the University of California at Berkeley). This book, in its sub-title "Planetary Astronomy in the Development of Western Thought" suggested, was far more than a straightforward historical account of how the ideas of Copernicus, Kepler, Brahe, and Galileo overturned the Aristotelian world-view that had dominated perceptions of the physical universe for almost 2,000 years. It was an excavation of the intellectual culture in which these scientific theories were produced and sustained. Implicit in its argument and structure were many of the ideas which when more theoretically presented in *The Structure of Scientific Revolutions* five years later were to enthrall and annoy philosophers of science.

This second book, on the popular and academic success of which Kuhn's worldwide reputation depends, has acquired a life of its own that has tended to push the particular intention of its author into the background. It has become a meta-text; but the text and the pre-text remain deeply significant.

Kuhn's intention was to break the naive belief in the great chain of progress

The Structure of Scientific Revolutions contained an uncompromising and unsettling message for scientists. It suggested that their own view of the development of science, as a heroic linear process, was a mythic delusion; if the actual history of science was examined in detail a very different interpretation would emerge. It also challenged the analytical and procedural preoccupations of contemporary philosophy, and confronted some of the most cherished beliefs of the Popperians who at that time still heavily influenced the philosophy of science, especially in Britain.

Kuhn's alternative was simple, maybe too simple because it could so easily be half-understood. He argued that scientific development was divided into two phases: long periods of what he called "normal science", step-by-step advance within the dominant framework of a reigning "paradigm"; and much shorter periods of revolutionary change when that "paradigm" had decayed and rivals were fighting to take its place.

Two subsidiary elements in his argument were equally radical. Kuhn suggested that the legitimacy of a particular "paradigm" was decided not by reference to some objective scientific norms but by its acceptability to the prevailing scientific community. He therefor suggested that "paradigms" were to a large degree self-justifying and so "incommensurable", or in plainer language untranslatable, one to the other.

The debate that followed the publication of *The Structure of Scientific Revolutions* concentrated on three elements in Kuhn's scheme. The first was the elusiveness of the term "paradigm"; one critic, Margaret Masterman declined to count 21 different uses. In a 1969 postscript Kuhn recognized some of the force of this criticism. He acknowledged that he used "paradigm" in two main senses; as a collection of ideas, assumptions, beliefs of a



scientific community, its world-view maybe; and as "muzzle solutions", outstanding models of intellectual success that could substitute for explicit rules. It is "paradigm" in this second sense that is crucial to Kuhn's philosophy of science, but the first interpretation sadly has enjoyed the greater popular influence.

The second was the definition of the scientific community that produced and validated the "paradigm". The popular Kuhn has stressed the breadth of this community; the precise Kuhn, the man himself, has always seen this community as a small tightly-knit group of specialists. The third was Kuhn's concept of "incommensurability", which has led to the charge of relativism being levelled against his philosophical scheme. This charge Kuhn denied but in his postscript he still insisted: "Debates about theory-choice cannot be cast in a form that fully resembles logical or mathematical proof." Kuhn's intention was to break the naive belief in the great chain of progress to which so many scientists remained thoughtlessly committed.

The most engaged opponents of Kuhn's ideas have been the followers of Karl Popper. In particular many have seen Imre Lakatos, the Hungarian philosopher who fled after the 1956 rising and died in London in 1974, as a formidable rival. Lakatos used Kuhnian material to come up with Popperian answers. Superficially the argument between Kuhn and Popper is difficult to appreciate; both were inspired by scientific revolutions of similar intensity, Copernicus's and Einstein's, to conclude that rival theories compete for supremacy in a Darwinian struggle.

But the differences ran very deep. Popper's is a permanent revolution that is compatible with a sense of linear progress; Kuhn's is occasional revolution separated by long periods of tradition-bound continuity. Moreover his idea of "incommensurability" makes it difficult to conclude, as Popper did, that one theory is superior to another; for Kuhn this raises too many questions - superior for what, to whom? But the greatest difference was more fundamental still. The Popperians suspected that Kuhn with his "puzzle solutions" was sneaking induction in through the back door and so challenging scientific method. He seemed to be asking "what is right?" about a theory; for Popper the only legitimate question was "what is wrong?"

His most uncritical admirers have been in social science and arts. This popularity puzzled Kuhn. He had thought it was the other way round; *The Structure of Scientific Revolutions* was intended to introduce into physical science, still committed to the heroic

myth of linear progress, concepts of periodization, continuity interrupted by radical breaks, that were routine in non-science subjects. His view now is more critical than puzzled. He believes that the thoughtless translation of his ideas back into social science has been "a disaster".

Not everyone would agree. Certainly the worldwide Kuhn phenomenon depends heavily on the investment social scientists have made in his ideas. But many of the problems Kuhn's scheme has run up against, the elusiveness of "paradigms" and the indeterminacy of scientific communities, have been exacerbated by its wholesale incorporation in the language of social science.

Kuhn had moved to Princeton in the 1960s and stayed there until his move six years ago to MIT. In the 1970s he put philosophy to one side, to the extent that the worldwide fall-out of praise and criticism which followed the publication of *The Structure of Scientific Revolutions* allowed. He went back to the history of science and wrote two books on the development of quantum physics and also published a collection of essays on scientific tradition and change.

The reason for this retreat to history was simple enough. "Writing philosophy is like walking around a stage set and opening a series of blank doors. In the hope of finding something interesting behind them. It's not like history where reading the original sources suggests a shape and a structure."

But now after a decade of opening blank doors and finding nothing interesting behind them Kuhn has returned to philosophy. He has gone back to the loose ends left dangling in *The Structure of Scientific Revolutions*, and has begun to untie and retie them, in particular puzzle-solving and puzzle-solutions that are so central to his scheme. But the book he expects to publish in about three years is much more than a revision, second tidier thoughts. Kuhn says: "I think I've made two great big breakthroughs. It's pretty God-damned exciting."

Thomas Kuhn is an "intellectual" academic. His ideas have spread out across all disciplines and have also seeped into the broader culture of our times. Within his own and adjacent disciplines his philosophical scheme has established itself as a true paradigm. But the popularization of his ideas is equally significant. They and he have watched our times. Popper born in 1902 became the philosopher of science's last heroic age, before its progressive beneficence had been called into serious doubt. Kuhn a generation younger grew to maturity in the shadows of the atomic age; maybe he has become the philosopher of science in its late 20th-century ambivalence.

Jon Turney reports on the multi-million dollar business of the California-based SRI International

When the British Department of Trade and Industry and the Treasury fell out with British Telecom over future regulation of price increases, they decided to try to resolve the conflict through outside research. To do the work, they turned, not to a British university or firm of consultants, but to the European arm of SRI International.

The Telecom study was a good example of the kinds of problems which have brought SRI to a \$200 million-a-year turnover today from its small beginnings soon after the war as the Stanford Research Institute. The institute has widely recognized expertise in analysing areas where technology, business and, often, public policy meet. And its outlying offices in Europe and Asia can draw on a broad programme of basic and applied research, mainly carried out at the institute's American headquarters at Menlo Park, on the edge of the Stanford University campus just south of San Francisco.

SRI is a case study in growth from a small effort to link university research with the needs of outside organizations. And the institute's president, Dr William Miller, says it is still unusual even for the United States. Although university administrators in Britain look enviously at the scale of industrial revenues on campuses across the Atlantic, Dr Miller says their contribution to industrial development in the past has been patchy.

However, the universities in California "took pride in their industrial relationships", he feels. This was especially true of Stanford, where Miller spent nine years as provost. The university's private status freed faculty members from restraints on outside work which sometimes apply in government-funded colleges.

Although this is changing, Miller believes SRI will still have the advantage, as it stands between the pure research orientation of an academic institution and the pure business outlook of a corporation. From Dr Miller's chair, he sees a complex mix of



A place in the sun: the SRI headquarters at Menlo Park, on the edge of the Stanford University campus south of San Francisco.

Getting rich on research

work: "Twenty per cent of our work is basic research, but we do commercialization, and all the things in between. And we do proprietary work and classified work, which many universities don't."

All these different types of work coexist at Menlo Park, just down the road from the rolling acres of the university campus. And the institute has outgrown the military hospital

buildings where it first found a home and now fills a cluster of purpose-built laboratories.

The president's job is to make sure the several communities on the site pull together. There are the scientists working on civil research, who are treated much like academics, and have beer parties on Friday afternoons in the Californian sunshine. There are other researchers working behind closed doors on the military work - all "defensive" work on topics like antidotes to chemical weapons and, no doubt, "star wars" - which still produces over a third of SRI's income. And there are the consultants, who wear business suits and deal in graphs, trend analyses and corporate strategies.

This mix of talents is one of the institute's strengths, according to Dr Miller, especially in its European operation: "We know both the technologies and the business side." He has found European clients much more interested in technology in the last two or three years.

But the need to sustain state-of-the-art basic research does create problems, even for an organization whose annual turnover is larger than the total of similar research and consulting outfits in Britain. Only four years ago, SRI International had a net income of only just over \$3 million on a \$160 million-a-year turnover. This was dangerously low for an operation that needs to invest heavily in new equipment and instrumentation to keep its laboratories up to scratch.

One reason for the cash flow problem was that many of the scientists with more academic inclinations had been given their head and were not covering their costs. This has changed under Dr Miller. In this way, the management-speak of the institution's annual report: "Departments and centres that fall short of their financial targets are subject to rigorous review by, and concentrated assistance from, SRI senior officers."

Translated, this means that areas where the organization cannot compete are cut. This has included much of SRI's work in social science, where low-overhead consultancies dotted around Washington can do the same job for less cash. And work on food and nutrition has also been reduced.

In this way, the institute has managed to increase its rate of internal capital investment to \$10 million a year. Current investments include new facilities for toxicology, an improved computer system and a new communications laboratory for defence research.

Of course, not all research turns a profit immediately, and the SRI managers have to find ways of supporting some open-ended projects to sustain future expertise, as well as to keep offering new opportunities to scientists who want to follow fresh lines of inquiry.

Some support for basic research,

around 10 per cent of the total institute budget of \$40 million a year, comes from outside grants or contracts, mostly from US government agencies like the National Institutes of Health or the National Academy of Science. This money is won in competition with ordinary university groups. But there is a more modest programme of basic research funded internally, to the tune of around \$4 million a year. According to Dr Miller: "The work we support ourselves has very high value because it can go on for several years and is completely unfettered."

There is thus a delicate balance between scientific impulses and business needs. Individual research groups within Menlo Park can put in a bid for funds from the Investment Fund, or more modest requests for seed money from the President's Fund. For the larger bids, a business plan is developed alongside the scientific proposals, and the work is expected to produce some income within a few years. Recent projects started in this way include work on advanced materials and drug development.

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Karen Gold looks at what is required in a deputy director

Wanted: high-flyin' fast-movin' sweet-takin' student-qualin' number-crunchin' money-savin' money-savin' money-savin' NAH-huffin' self-validated' car-parkin' deputy/assistant polytechnic director.

Or two. Nine polytechnics have advertised for, though not always appointed, 13 deputy or assistant directors in the last few months. New blood is rushing to the head of Birmingham, Central London, Lancashire, Leeds, Liverpool, Middlesex, Newcastle, North East London and Wolverhampton polytechnics.

The vacancies they are filling have arisen either through management reorganization or premature retirement, frequently both. With the last mergers and absorption of teacher training colleges now ancient polytechnic history almost everywhere, those changes have meant that as always with exceptions - a breed of number cruncher and number three people are climbing the polytechnic ladder.

First, what they are not. None of them is a former or redundant head of a teacher training college. None of them has been "merged in" so there are no quasi site managers. Virtually none of them is from universities. None is from industry. Hardly any come from colleges of higher education. None is from the schools or the inspektorate. None of the new appointees is a woman, although there are three women in polytechnics now at this level.

Next, what they are. They are younger than their predecessors: late thirties to late forties. Their relative youth suggests they will move, and move on, quickly. They already work in polytechnics, very often as deans or heads of department. Frequently they are internal candidates for assistant or deputy jobs. Their academic background is varied with social science on the increase: gone are the days when only an engineer or a chemist was chosen to run a polytechnic. Indeed Central London this summer advertised for a non-engineer to broaden the profile of its management team.

Polytechnics are producing their own managers: ambitious people, climbing a clear career structure, with public sector rather than university teaching backgrounds (though still with university degrees), with an inside knowledge of the validation and national planning system (an assistant/

Moving up the poly ladder

deputy is usually responsible for the endless flow of paper and numbers from the National Advisory Body and validators) and with experience of working within a local education authority.

That affects not only the kinds of people who get the jobs, but also the jobs they are asked to do. Polytechnics are currently experimenting with new management structures. Many are dispensing with their old People/Buildings division, if only to add another post to those two to oversee "academic affairs". Several, notably Birmingham and Wolverhampton, have recruited for a specifically "external affairs" post: liaison, fund-raising, public image men. Others, for example Middlesex, have taken on accountants, for a role similar to a company secretary.

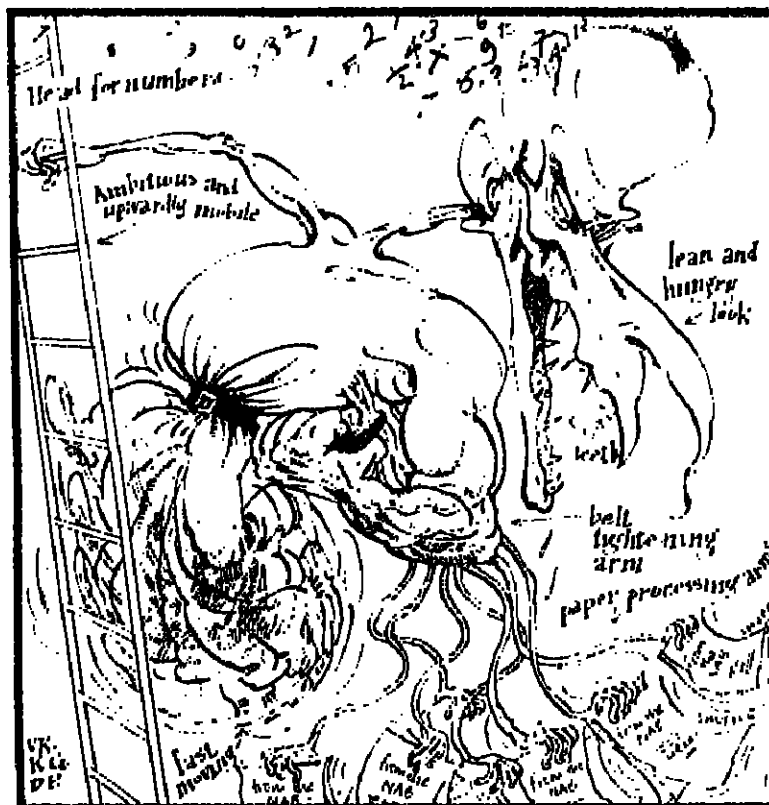
In the past some local authorities have tried to prevent their polytechnics acquiring too much management expertise, in case they became too independent. Again with exceptions - Leeds is still disputing a candidate with the local authority, Newcastle has just filled a long-vacant

and twice-advertised post with an internal candidate - the trend among local authorities in the late-capped, efficiency-study days is to want their poly managers to be capable of running a tight ship.

Hence the selection process for assistants and deputies has also moved out from the governors. For several recent appointments candidates were interviewed over two or even three days, talking to staff, students and trades union representatives whose opinions, if not decisive, were certainly influential.

Strengthening internal voices in selection, apart from the danger that it might lead to bland compromise candidates, also reinforces the trend towards a polytechnic cadre of appointees. The opponents of that argue it is dangerously inward-looking. Its defenders say that, with the sector now highly complex and well established, it is both risky and inefficient to appoint outsiders.

The new lean and hungry men, they say, will be running the polys in five or ten years time.



The bosses' view - why many apply but few are chosen

Despite warnings that a good polytechnic head of department with substantial consultancy work can earn far more than an assistant or even deputy director, there is no shortage of applicants: lately an average of 50 per cent.

But a closer look at the applications shows a smaller pool of strong candidates. Several of the recent appointees featured on two, three or even four shortlists when so many vacancies came up at once.

One of the nine appointing polytechnics has shown *THESE* details of its applicants. Over 40 men applied for the job, and four women. The oldest was 60, the youngest a somewhat unrealistic 29. By far the largest group was polytechnic heads of department: 22 of them. Eight were from universities and around the same number from colleges of further and higher education. One was from industry. Of those who had industrial experience, it mostly ended 15 or more years ago.

Twenty-three had PhDs; the largest academic group was social scientists (13) followed by engineers (10) and chemists (7).

By contrast the shortlisted candidates were all from polys, with an age range of 38 to 49. Virtually all were social scientists. They tended to write more fully about their polytechnic experience.

Above all they did not append four, six, eight or even 10 pages of research titles and publications. That kind of application, leaving aside the semi-legible ones, was most indicative that many applicants did not know a great deal about the job they were applying for.

University applicants who "liked students" therefore thought they were suited to students' affairs. Others pointed to involvement in school or departmental administration and curriculum review, but offered no feel for the running of an entire institution.

Overall at least, some of the directors recruiting

their right-hand-men were unimpressed. "Not overwhelmed," said Leeds director Dr Patrick Nuttgens's verdict on his applicants: "Average capable people, but I can't pretend I was bowled over."

"What disappoints me," said Lancashire's Eric Robinson, "is that I see so little in most of the applications that excites me and makes me interested in the people. It's either a dearth of people with ideas, or that excitement and challenge just aren't encouraged."

"There was often a lack of interest in education rather than administration, and scrappiness of presentation," said Birmingham's new director, Dr Peter Knight. "An assistant director has got to have ideas about education; he's got to be able to talk about education and believe in it. And he's got to be able to argue with the director even if he's the director says 'OK, sunshine, I'm the director, this is how it's going to be.'"

Putting theory into practice for 25 years

David Jobbins reviews the University College, London, conservation course

Twenty-five years ago this month a dozen students crawled out of their tents on the remote Norfolk coast to begin what has proved to be a major success story in matching education and the practical demands of conservation.

Those students who made their way to the field laboratory in an old lifeboat hut on Blakeney Point were the first of almost 250 who have taken the post-graduate course in conservation begun at University College, London, in July 1960.

Many of them are now working as conservationists for the county nature trusts or for other organizations where the practical skills they acquired in the year-long course have been of immeasurable value. Others have slotted themselves into the conservation movement with a facility which remains the course's practical advertisement.

The course's current director, Dr Roderick Fisher, lays heavy emphasis on the small-group teaching involved, and the consequently high proportion of contact between staff and students.

The teaching year begins in September with three weeks of field work beginning with a spell on Blakeney Point to practise techniques and essentially to get to know one another. Visits are then made to organizations such as the Institute of Terrestrial Ecology, the Forestry Commission, and others while the next stage is an examination of possible conflicts over land use.

Intensive teaching on ecological and conservation issues involves staff from other departments at UCL, as does the next stage when planning, economic and legal considerations for land use

are introduced. Emphasis is placed on group teaching through a continuous seminar on a specified theme - this year the concept of rarity and its implications for conservation strategy.

As well as individual projects students work on a group project which stretches over five weeks, involving a field trip which is often abroad. This year the target was Spain and the Copadonga region where the impact of more intensive agriculture, resulting from Spain's membership of the EEC, is expected to have a dramatic effect on its rich bay meadow habitats.

Projects have often had practical value and significance way beyond their teaching value. The 1969 project in the Isles of Scilly, examining the impact of recreational pressure on the ecology, has sparked off an entire area of activity of intense interest to ecologists and wildlife managers.

Similarly in 1976 a format for a nationally-applicable management plan for reserves was devised at the request of the NCC which went far beyond the old model of a scientific description of what was to be found and examined the scientific value of a site and the various pressures and constraints on it.

The course now has full London University MSc status, but in its early years was run as a postgraduate diploma. Max Nicholson, one of Britain's leading ornithologists, and at 81 still a driving force at world level in conservation matters, was, with others such as Sir Julian Huxley and Professor W. H. Pearsall, instrumental in establishing the UCL course.

Now he thinks it was something of a gamble. "We must have been out of our heads," he says with characteristic



The first students on University College's postgraduate conservation course hard at work by oil lamp in an old lifeboat station.

candour. But as director of the then Nature Conservancy (now the Nature Conservancy Council) Mr Nicholson was less than happy with the performance of the people who gravitated towards conservation work.

The commission had supported for several years a number of doctorate studentships. "Quite apart from the fact that a number of them were not very strong on spelling and grammar, they tended to be over-specialized and tended to think very much in terms of research problems rather than the practical application of research."

"We found out very early that there would be a need for a group of postgraduate-trained recruits to give proper advice to bodies including local authorities about the application of ecology and the practice of conservation itself."

The Nature Conservancy, by this time establishing its own nature reserves which needed managing, decided against offering the training itself

department. With applications running at 250 a year competition for 12 places is intense with more than 8 per cent with firsts and almost all the remainder with upper seconds.

A small but increasing proportion are mature students, and course leaders actively welcome their presence. Some are seconded from Government departments but others come from Manpower Services Commission-funded short-term employment with the voluntary organizations.

Overseas recruitment, often funded through British Council programmes, has been an added source of broader experience on the course, with students from developing countries joining the others from Western Europe and North America.

The production of students with the diploma or later the MSc coincided with and essentially helped to fuel the massive expansion in conservation activity in the 1970s. Ninety-five per cent of students find jobs within six months.

This has been achieved in two ways. First the Nature Conservancy, which was directly involved in initiating the course, was able to predict with some accuracy what its needs would be. Secondly the county trusts and other voluntary conservation groups got into top gear.

One person to breathe a substantial sigh of relief at the course's good employment record is Mr Nicholson himself. The Treasury, which had been involved in the approach to the UGC for funding, was, to say the least, nervous lest the students would complete their course and join the ranks of the unemployed.

His optimism is shared by Dr Franklyn Perring, director of the umbrella group for the county trusts, the Royal Society for Nature Conservation. "The next five years are likely to see a doubling in the number of staff employed in the conservation field. We are all planning to launch appeals for large sums of money to acquire reserves and we will need people to manage our estate, which, with 120,000 acres is now second only to the National Trust."

But over the next eight years, 72.8 per cent have had at least half their undergraduate training in a biological

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All American generalization

Bruce Collins looks at the tactics of General Ulysses Grant and his legacy of 'unconditional surrender'

Most Americans regard themselves - rather than the British used to - as an essentially unitary if not anti-militaristic nation, somewhat burdened with far-reaching military commitments. Some thoughtful Americans have, therefore, detected a contradiction between this self-image and their country's commitment to absolute victory - "unconditional surrender" demanded from the enemy - in two world wars, to extraordinary overkill in Vietnam, and to massive retaliation and mutually assured destruction in nuclear strategy.

A number of historians have traced this contradiction back to America's own Civil War, and have described the origins of such strategies of annihilation - as well as the very term "unconditional surrender" - to the North's victorious general-in-chief, Ulysses S. Grant. The centenary of Grant's death on July 23, 1885 will not be one of the most warmly commemorated of such occasions, but it offers an opportunity to question the value, and sense, of that strategic genealogy.

Grant's reputation has been tarnished by his record as president from 1869 to 1877. Some of the criticisms are unfairly censorious. He spent a great deal of time agonizing over minor

appointments to public office, but this was typical of 19th century presidents who found themselves at the head of factions, parties hungry for patronage.

On central issues of economic policy he tended to be cautious and much swayed by the advice of leading businessmen; not surprising for the leader of a nation dedicated to business enterprise and typically deferential to business opinion. Bold efforts to protect the emancipated slaves' civil rights (in 1871 and 1875 he urged legislation through Congress) were not matched by energetic enforcement, yet here he both feared accusations of Caesarism and judged that Northern opinion would not tolerate a large-scale military policing of the South in the 1870s.

By 1872 many of the most critical Northern intellectuals were frustrated by the General's vacillating peacetime leadership. The economic depression beginning in 1873 and the steady series of financial scandals that touched his cabinet and cabinet, if not Grant himself, deepened the reaction against Grantism.

Yet in 1865 Grant stood apart as the consummate organizer of victory, as the determined executioner of Northern grand strategy. Admittedly, many questioned his military genius; merely to set his name beside Lee's is to suggest compellingly why he lacks popular following and fame. Even so, military historians have often alluded to a "Grant tradition" in American warfare. Why, then, 100 years after his death, is it worth pondering Grant's military reputation?

His very ordinariness gives him considerable claim to the elect of American folk heroes. He was born in 1822, not in a log cabin, but in a modest house. His father had the appropriate credentials: small-town, a self-made tanner, who had ascended the first

Strategy of annihilation: the dead of the 1st Minnesota Infantry

rung of political status when he became mayor of his community in 1837. Two years later, the young Ulysses Grant entered West Point, after being nominated by the local congressman. Military college failed to nurture any great talents. Grant read novels, made no impression and few friends and eventually, perhaps predictably, married his room-mate's sister. During the Mexican War of 1846-48 he served as a quartermaster; though he sought a combat command, he did not achieve any distinction and when war broke out between North and South in 1861 no army contact sought his services. Peace-time postings offered boredom, and when he was separated from his wife between 1852 and 1854, acute strain. He resigned his captaincy in his early thirties. This in itself was not unusual, for many West Pointers served briefly in the army; less typical was Grant's drifting between 1854 and 1861. Many officers used their training in engineering or surveying to land lucrative jobs with the burgeoning railway companies. Grant, though, tried his hand briefly at farming, drifted to urban employment and finally fell back on a clerkship in the family leather goods store. In the quest for financial security on the edges of middle-class society he exemplified the struggles of a generation, and his claims as an authentic man of the people exceeded those of Abraham Lincoln.

It is this very background that makes Grant's military career from 1861 to 1865 all the more surprising. He responded to the call for volunteers at the beginning of the war and was made a colonel. Unlike George McClellan, three years Grant's junior at West Point, he entered senior command in 1862 with no obvious relevant experience and none of McClellan's administrative assiduity. It is difficult to trace precisely how he developed an understanding of command and warfare.

He was a notoriously silent, self-contained and essentially reserved man. His intellectual interest in strategy and military matters before 1861 was non-existent. His wartime letters and orders are not as illuminating as one might wish and he wrote his memoirs nearly 20 years after the war, racing against an impending death to bequeath a nest-egg in royalties for his wife's widowhood. Furthermore, he has not been well served by his biographers. Major-General J. F. C. Fuller wrote a spirited, fresh reappraisal of Grant's growth and greatness as a general, but Fuller who was partly reacting in 1929 to the powerful anti-war spirit of his times almost goes overboard in his trenchant revisionism. Against this, William McFeely's Pulitzer Prize-winning biography of 1981 devotes less than one-third of its text to the war years and is more concerned by what Grant's self-fulfilment in war tells us of 19th century American values than with assessing tactics and strategy.

An additional difficulty is that with the continuing debate over grand strategy. Basil Liddell Hart, in his enthusiasm for the indirect approach, saw Grant as the forces' slogger, pounding away at Lee's armies in north Virginia in 1864 and 1865, while the

real genius of manoeuvre and mobility was displayed by Sherman in his flanking and daring march to the sea. Grant's determination to stick to from May 1864 to April 1865 not only earned him a contemporary and subsequent reputation as a butcher, it also produced later theorizing about a peculiarly American strategy of "annihilation". Those who inflict atomic bombs on Hiroshima and Nagasaki and who thought to break the Vietnamese guerrilla movement by sending B-52s against the North were, in the view of scholars like McFeely and Russell Weigley, Grant's true heirs.

Theoretical generalizing - let the pun stand - from Grant's record is historically misleading. It makes events too neat, too readily pigeon-holed into right or wrong, intelligent or blundering. Grant, while still commanding west of the Appalachians, was asked for his thoughts on eastern strategy during the winter of 1863/64. He suggested that attention be shifted somewhat from Lee's army; an expedition should be launched from the sea into North Carolina, with Raleigh and Wilmington as its objectives. Here, then, was the indirect approach. But once Grant took command of all Union armies, on March 9, 1864, his focus fixed, like his predecessor's, upon the Army of Northern Virginia. Who contributed precisely what to the grand strategy that followed is difficult from surviving evidence to say; neither general-in-chief nor president were energetic draftsmen.



What can be said is that the grand strategy for the rest of the war, and laid down by Grant on April 4, 1864, conformed to Lincoln's ideas. Grant's strength was in coordinating the attack on all fronts. Early on, he pressed his subordinates to pare down their garrisons, to rely on light cavalry to control occupied areas, to curtail efforts merely to rule territory, and to prepare for a vast and coordinated spring offensive. Troops on the Mississippi and in Louisiana were to capture Mobile, sever the Confederate lifeline to the outside world and to establish a Federal supply route up the Alabama river. But the principal move was to be Sherman's push against Joe Johnston's army in the deep south with Atlanta and Georgia more generally as the main geographical target. Meade's army's attack upon Lee - and behind Virginia campaign of May to June 1864 and, afterwards, the long stalemate that earned Grant his reputation as a butcher.

This grand strategy did not spring from any original or peculiarly American determination to wage war of annihilation. Sherman later pointed out that it followed Napoleonic maxims in attempting to bring superior forces to bear at decisive points. Moreover, the Virginia campaign, which became so bloody, was shaped by geography and the Confederates' commitment to the defence of Richmond. The ratio of forces to space - 180,000 men in a gap only 80 miles wide and 75 miles from Richmond - dictated the character of the subsequent fighting. This was well recognized by the Lincoln administration.

Even in August 1864, when Lincoln privately despaired of winning reelection in November, he anxiously sought ways of continuing the war at full pace until his successor's inauguration, if only that he might "have stood clear before my own conscience". Political commitment, on both sides, combined with geography to produce the campaign of 1864.

Nor was this surprising. Grant was a pragmatist. In the west he was capable of audacity. The Vicksburg campaign preceding the siege was regarded by general-in-chief Halleck as Napoleonic in boldness, rapidity and brilliance. But Grant also got bogged down in slogging matches at critical strategic points, such as the subsequent Vicksburg siege. His talent lay not in elaborate theorizing but in uncluttered application to the problems at hand. He was not a man of passionate moral commitments and entertained no special interest in slavery before 1861. It seems doubly strange that a man so untheoretical and so largely free of dogma should be the supposed originator of something so formal and so chillingly coherent as a "strategy of annihilation".

The truth of the matter was that Grant coordinated strategies that had been variously tried before. Nor was his effort to exploit a range of possibilities so starkly contrasted with Napoleonic warfare as many military historians suggest. After all, Napoleon used diplomacy as a vital supplement to his dashing victories; he resorted to blockade against Britain and his sprawling corps' grand movements blighted, even bankrupted, the lands through which they marched. Finally, Grant followed Napoleon in seeking decisive battles and in shunning simply territorial gain. But Grant faced an enemy with widely dispersed forces, whose leaders could not (as in Europe) be played off against one another, and whose defences at the key point, were tried, tested and tenacious.

If Grant's tenacity were to have some salutary effect, it might be to remind us again that complex minds and contrived models are not much use in the fog of war. Pragmatism, determination, the broad view and above all coordination were Grant's characteristics. The strategies of indirect approach, annihilation and decisive battle afford convenient intellectual constructs to clarify analysis of events, but it is dangerous, if not dishonest, to rely these into contrasting and clear-cut explanations of what occurred.

The author is lecturer in modern history at the University of Glasgow.

Nigel Thrift examines a shift in the frontiers of British economic geography

There was this Englishman who worked in the London office of a multinational corporation based in the United States. He drove home one evening in his Japanese car. His wife, who worked in a firm which imported German kitchen equipment, was already at home. Her small Italian car was often quicker through the traffic. After a meal which included New Zealand lamb, Californian carrots, Mexican honey, French cheese and Spanish wine, they settled down to watch a programme on their television set, which had been made in Finland. The programme was a retrospective celebration of the war to recapture the Falkland Islands. As they watched it they felt warmly patriotic, and very proud to be British.

RAYMOND WILLIAMS, *Towards 2000*

Until a short time ago, the majority of those who studied the economic geography of Britain confined their interest to the space between the Shetlands and the Scillies. What went on inside these bounds was considered relevant. What went on outside them was considered, if not irrelevant, then able to be consigned to various regional specialists. The rest of the world was delegated.

But over the last few years this insular attitude has started to change. Three developments, in particular, have forced economic geographers to take the rest of the world off the shelf, dust it down, and look at it anew. The first of these was the increase in the foreign ownership of British industry.

Research of spatial variation in the extent of foreign ownership of British manufacturing industry began in earnest in the 1960s and has continued ever since, spurred on by new phenomena such as the limited but still significant influx of Japanese manufacturing industry.

Research on the second development can be dated with some precision. In 1979, exchange controls were lifted and, as a result, British-owned capital has flooded out of Britain, on a scale that may yet turn out to be comparable to capital export in the years between 1870 and 1914. This outpouring of capital has underlined once again the extent and importance of the British "offshore" economy.

It has also produced, important effects on the cities and regions of the "inshore" economy, for example differential employment decline. It is no surprise, then, that economic geographers have become increasingly interested in what has happened to the space economy of inshore and offshore Britain after 1979.

The third point follows on from the previous two and links them together. That development consists of changes in the form and functioning of multinational corporations. Many of these have now gone "global", changing to a style of operations which is, in some respects, different from that found in the past.

Conscious efforts have been made by a number of multinationals to integrate production, marketing and finance at a global scale with a number of important spatial results such as the decentralization of certain types of production and administration. The importance of this kind of development has been strengthened by the extension of multinational activity into most parts of the British economy, and especially the service sector. The upshot has been that research into multinational corporations has become an established theme in economic geography.

Taken together, these three factors mean that today's economic geographer is faced with a rather different prospect from that of his or her predecessors. The British-owned space economy has become increasingly decentralized from Britain. It has diffused across the world and reacts more swiftly and more acutely to the currents of world economic change. Meanwhile, the foreign-owned industry within the British shoreline provides a kind of replacement, at least to judge from the determined competition between cities and regions to attract foreign investment.

This view of the world demands a less parochial attitude to what constitutes the economic geography of Britain because so much of what goes on cannot now be explained without reference to what is happening outside it. And it requires the brushing-up of old skills, specifically knowledge of other countries.

It could be argued that economic geography should have come more easily to this view of the world than has been the case; but perhaps the subject shares in a more general malaise which has gripped the social sciences. "British geography has largely disengaged itself from a concern with the world as a



Out of bounds . . .

West. These now fare less well, partly because of the number of British-owned multinational corporations in the city, especially the food, drink, tobacco, paper, printing and packaging industries are heavily in abeyance to foreign or British-owned multinational corporations. In 1979, some 58 per cent of total manufacturing employment in Britain was controlled by foreign or UK multinationals.

In contrast to work on foreign ownership of the inshore British economy, research into the expansion of the British offshore economy in foreign economies is more scattered and more selective. Peter Dicken has summarized the country pattern of overseas investment by British manufacturing firms but still surprisingly little is known about the precise location of this investment within countries except for certain cases like the United States, Australia and South Africa.

Even in these countries information often comes from aggregate statistics. Studies of British-owned economic activity in cities of countries like these are only now beginning to be tackled by our economic geographers. The impacts of the expansion of the British offshore economy on the economies of UK cities and regions are difficult to gauge. One which is clear, however, is the increasing propensity of British multinationals to run down their UK workforces relative to the numbers employed in other parts of the world. Ian Clarke, of Aston University, has shown this process at work in the case of ICI.

Using *Financial Times* data, Alan Townsend of Durham University has been able to provide a detailed breakdown of job losses in the plants of particular foreign multinational corporations from 1977 to 1981. Interestingly, he found that the overall rate was considerably lower than in British-owned plants.

Job losses from the plants of foreign-owned multinationals has, to some extent, been ameliorated by particular national groups of foreign multinational corporations still at an early stage of setting-up UK plants and offices.

Much attention has been given to the influx of Japanese-owned industry, limited though it still is. Peter Dicken at Manchester University has analysed the overall spatial pattern of Japanese investment in manufacturing industry. Kevin Morgan and Andrew Sayer, of Sussex University, have considered a number of Japanese and other foreign-owned electrical engineering plants in South Wales. Many of these plants are pioneering a new style of labour relations which may well have significant effects on British industry as a whole.

It is also possible to address the impacts of multinational corporations on particular localities. Keith Bassett has investigated the extent and form of

multinational penetration of the economy of the city of Bristol. Certain manufacturing industry sectors in the city, especially the food, drink, tobacco, paper, printing and packaging industries are heavily in abeyance to foreign or British-owned multinational corporations. In 1979, some 58 per cent of total manufacturing employment in Britain was controlled by foreign or UK multinationals.

This does not mean there are no gaps in the research economic geographers are currently pursuing. Two of these are of particular importance. First, the service sector remains something of a mystery. Within the British shoreline, foreign ownership of the service sector is clearly increasing. There are the foreign takeovers that make the news - Harrods, Fortnum & Mason, but there are other signs of foreign penetration of the inshore service sector that are more important. For example, foreign banks now account for a third of total loans to British manufacturing industry, yet very little is known about the extent or spatial pattern of this foreign ownership. Outside the British shoreline, UK service sector multinationals have been expanding fast - world trade in services is growing at twice the rate of trade in goods.

In particular, British producer service corporations have been growing rapidly; corporations like Saatchi & Saatchi in advertising, Jones Lang Wootton in real estate consultancy and Price Waterhouse in accountancy. Price Waterhouse now has a worldwide workforce of 26,500 spread over 348 offices in 93 countries. In 1984 it earned \$1.150 million in fees for its professional services. Again, little is known about these corporations.

The second gap concerns property investment. London of course, is the site of much foreign property investment, but more spectacular has been the outflow of the funds of British pension funds, insurance companies and the like since 1979 into overseas property. With the exception of Michael Bateman at Portsmouth Polytechnic few other economic geographers have seemed willing to study the destination of this investment or the magnitude of its economic returns. Claps like these do not act as an indictment of economic geographers. Given their numbers and the available level of resources, the response to the internationalization of the British space economy has been remarkably rapid. However, the gaps do suggest that what is currently needed is that those in charge of promoting research bolster this change of orientation. This will not be easy, given these straitened times. But the issues that require investigation are undoubtedly of considerable national importance.

Peter Lloyd and John Shutt, of Manchester University, have shown the end result of this kind of process of labour force redistribution, when it is applied across a number of British multinational corporations, in the case of the North-West of England. There, the process has served as an important determinant of job loss. Further, the surviving British plants are now more likely to be compared with plants in other countries, generating pressure on these plants to change their working practices to conform with their siblings.

These few examples show that the

global context of the British space economy is increasingly being explored by economic geographers (and sometimes with funding from the ESRC). The results of their work are adding to a growing body of knowledge on the subject which is excitingly interdisciplinary in character. Research by economists is particularly noticeable. For example, there is the work of Hood and Young on multinational involvement in the Scottish economy and the investigations by Dunning and his colleagues at Reading University into topics like the pattern of British overseas investment and the spatial distribution of the regional head offices of multinational corporations in Europe.

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مكتبة الأصل

Bernard Crick



Oh, to be in England now that Thatcher's out

Horrid old Ezra wrote, of course, "The Great Boats of the World". He was a great poet but also a fascist (I cannot see any reasonable doubt about that, or why, if one holds the view of him, one has to deny the other). But his political judgement was bad, whether as a fascist or a poet. Churchill was out but the changes that followed were not what he expected or liked. As regards Thatcher, I'm not worried in counting chickens before they are hatched - for the auguries are clear, Brexiteers, and anyone with the least political judgement must feel that most people have decided, vaguely but powerfully, that enough is enough. But I am worried, thinking seriously for once about the narrow preoccupations of this journal, that expectations of great changes in our lot are growing. Paradoxically most of the expectations are not really of change at all, but that following the fall of Thatcher, whether at the polls or before them by the knives of her cabinet colleagues, things will, as all Whig revolutionaries desire, get back to normal, to the status quo ante-Joseph.

This will not happen. For us it will be out of the frying pan and into the fire. If the University Grants Committee and the Committee of Vice-Chancellors and Principals are playing for time, they are mistaken and are badly misreading the basic political and economic situation facing any future government. I admit that it may be unfair to accuse them of playing for time, it may just be that they find it very difficult (as your editorials so often and rightly say) to formulate policy at all, whether because of the kind of people they are or because of the concensual inertia of the system.

Whatever Government takes up the burden, de-Thatchered Tories, Labour or (for I'm a good social scientist so rarely confuse what I want to see what I think will happen) some kind of coalition, the economy will not revive like magic. Fierce controls on public expenditure will continue, and in so far as it seems political common ground that the attempt will be made to reflate the economy by increased public expenditure, the priorities for expansion are unlikely to involve the universities. Road construction (and repair) and building are known to have the greatest multiplier effect economically, and politically the clear priorities will be the National Health Service and primary and secondary education. I'm only making obvious and objective political judgements, but I cannot forbear to say, "can we deny, as citizens and moral human beings, that these should be the priorities?" Special pleading is so transparent, and irritating.

What I have said is unpopular enough for one outing, but we should also remember that even before Thatcher, the universities had lost their sympathy in public opinion which, reaching the politicians, had given solid support to the vast public expenditure needed for the Robbin' expansion. Many factors would have to be combined to explain this. Student behaviour in the times of troubles, and how it was exaggerated in the popular press is one. Another is that the expectations aroused in the period of expansion were too high: what came out of all the new university rhetoric and the bricks and mortar everywhere, was depressingly familiar - more did not mean worse, it meant much the same. Labour politicians were disappointed that the universities have, by and large, both failed as vehicles of social mobility for the straight-from-schools and failed in anything more than lip service to continuing education.

tion, community education and part-time education; and Conservatives felt that most of the talk of "a contribution to industry" was just to fool them, the post-Robbins curricular mixture remained much as before.

Perhaps more fundamentally, the universities appeared self-satisfied and demanding, checking off any discussion of what the public and the students really wanted with a preemptory smokescreen that a demand rather than a supply mental economy would "endanger standards". Not merely the Left but Thatcherites came to call this condescending and elitist.

Though it hurt me to say so, I think the best friends of the university lobby among politicians will be found in the Liberal Party and the SDP (and little good that may do them - I'm torn by a deep ambivalence). In the days of expansion the universities neglected their public relations. The civic universities, which are the backbone of the system, were tempted to neglect their old local roots, seeking to operate in an almost purely national constituency of funding and of students. And, I saw it vividly on college levels, we refused to face the obvious fact after 1974 that the economy was not in one of those familiar, good old "stop-go" cycles, but was in secular decline.

Our thinking was conditioned by the old cycles. I remember when a few of us argued in 1974 against new ventures and for consolidating only the best of the old (and very few of us did so), we were called "depressive" and "melodramatic" by stolid colleagues who were embarrassed by the intrusion of any talk of "external" (sic) economic and political factors. (We were an odd alliance of socialists and Thatcherites - the centre was unflappably unrealistic and obtuse). The same thing happened all over the country.

The pity is that we wasted the years of plenty. No wonder the purely economic and technological arguments of the Green Paper may be thrust upon us, if not by this Government by the next. It filled a vacuum. Since the universities spoke out for no higher idea than "value for money", the universities maintained a highly traditional and specialized curriculum, far more effective in training scholars than in creating broadly educated cultivated men and women (ie attuned to their society's culture), small wonder that a Government should recommend a greater concentration on whole subjects thought to be, sometimes rightly and often wrongly, specially relevant to the economy.

Most of us reply to the Green Paper publicly by saying that the needs of the economy must include "flexibility", and are in any case difficult to predict (what price "manpower planning" indeed!), and privately we say that it's assumptions are grossly phillistine - not just an arts complaint, scientists are very aware of the suburban-Thatcherite disdain for any basic research which cannot be rung up on the till presently.

This is true, as far as it goes. But politicians and the public know that it does not go far enough. "Flexibility" must be found in the curriculum itself. This we have almost desperately wished not to face. "My subject cannot be taught in less than nine papers," etc. I have heard this nonsense all my life, but the best part of my education was at Harvard: high standards and a broad curriculum. Whatever happened to Lord Sower's great argument for an education in "two cultures"? That was supposed to be the (subordinate) role of the polytechnics. We mocked the man and ignored the matter. As Gladstone found, the universities cannot or will not reform themselves. Education is, too important to be left to academics.

In The Gutenberg Galaxy, Marshall McLuhan argues that technology is our hope for the future, writes David Corker

For the great Victorian synthesizer, Herbert Spencer, the universal form of the law of evolution was the movement from incoherent homogeneity to coherent heterogeneity. The random movements of particles within nebular gases or of protozoa became the specialized, differentiated and yet integrated biological organism, solar system, or eco-system, in which the whole is composed of qualitatively different forms, all contributing to the dynamics of the totality, as in the cells of the human body.

Marshall McLuhan's *The Gutenberg Galaxy* assumes a similar goal for life and begins, on occasions, to sound alarmingly like Spencer's evolutionism. However, for McLuhan things are not going to plan, or at least have gone badly off course for four or five centuries. The technology of print has generated a homogenous and fragmented world which has so mesmerized us as to have had incalculable effects upon the relationship of our senses one to the other and to the relatedness of one human being to another, and of humanity to the rest of the universe.

Of course, McLuhan was not the first to alert us to this state of affairs. He himself acknowledges Blake, Yeats and many others in the English literary tradition which was his own academic and intellectual starting point. Where McLuhan's analysis differs from its tradition is in the centrality given to the forms of media themselves, rather than to the rationalist or mechanistic systems of Descartes, Locke or Newton. These he sees as products rather than causes.

Reduced to bald outline, *The Gutenberg Galaxy* argues that with the growth of printed texts, the intimate bonds between the physical act of writing and the auditory act of hearing are broken (he maintains that until the 16th and 17th centuries silent reading was unthought of). Words assume a primarily visual existence as repeatable uniform markers of things "out there" instead of being what they always had been, mediating forms between individual and collectivity, complex, mythically laden symbols. Typography insinuated that as mechanically reproducible, uniformly repeatable commodities, words, and the ideas behind them, lead a separate and serene existence in the world as labels of physical entities.

On the one hand this produced a merely positivistic attitude to natural phenomena as similarly resistant and enduring objects embedded in a mechanistic schema, and on the other for human beings in society to be seen both as separate individuals and as an undifferentiated mass of cogs.

In maintaining the exploration of perspective and fragmentation, this homogenization and fragmentation, space came to be conceived as rectangular, shaped by a projection of the picture frame and organized within that frame from the point of view of the "vanishing point" of the notional beholder's eye. Every point of view was thus distinct, separate and thus subjective, yet defined by an abstract relation to all possible points in space, each of them the equal of any other.

Where McLuhan scored over such eminent predecessors as Bergson and Heidegger was in his prescription of a cure for our ills. In the source of the problem - technology - he also saw the glimmering of a solution. Whereas mechanical reproduction of books, and the mass reproduction of cloth, steel or automobiles gave us a world of linear causality, uniformity and regularity, the new electronic age provides us with quite different models.

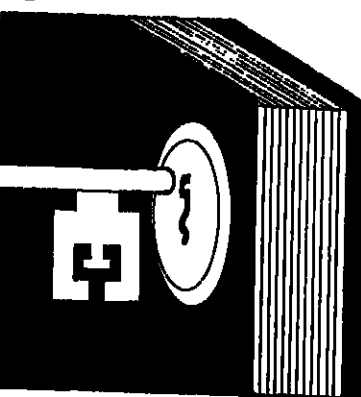
Since electronics affords instantaneous communication across all terrestrial distances, direct recording of speech and music without the intervention of a mediating coding system such as writing, the new media could reintroduce a world more like the audio-visual one we possessed before its loss to the view of the mechanical world.

In this new space, a multiplicity of objects announce their presence by their activity instead of being passively located in the visual field of the observing eye. No "points of view" of the relevant or possible here: since this space is not closed and rectangular like the space of Cartesian coordinates. The reason why students used to present their lectures in the late 1960s - multi-media presentations instead of essays now becomes apparent. There are three key words: disruption, juxtaposition and participation. Any disturbance of the homogenous world of neutral, visible things was good in that it woke us up to what we had taken for granted: "technology as environment" is typically "unconscious" we must "bless culture shock as dislocation of mind and meaning".



Marshall McLuhan: things are not going to plan

Hot and cool in the global village



see it all." If this seems no more than a nostalgic echo of the counter-culture heyday it is perhaps sad that so much original, stimulating and pertinent thought should come to be dismissed along with its undoubtedly loved optimism and absurd overstatement of its case.

With the impact of Jacques Derrida's "grammatology" it became increasingly difficult to justify the primacy of speech over writing or the presence of the human in the face-to-face as opposed to its absence from the purely visual medium of print.

Similarly, in literary criticism the confidence with which deconstructionists set about the task of reinterpreting all literature as subversion of previously established conventions and assumptions has started to give way to bewilderment and disillusion. Irony as absolute negativity, but without McLuhan's devout belief in harmony, produces the same effect.

A comparison between McLuhan's thesis and those advanced in the inter-war years by Walter Benjamin helps to locate *The Gutenberg Galaxy's* credentials and its popular appeal. Benjamin had pointed to the difference between the oral traditions of storytelling, with their emphasis on practical counsel and "wisdom", and the novel, which was made possible by the invention of printing and which participates in a world of information, verifiability and explanation.

In his classic essay "The work of art in an age of mechanical reproduction", Benjamin had argued that photography drove a wedge between the work of the hand and that of the disembodied eye looking through a lens; and that this plus printing led to an emphasis on "transitoriness and reproducibility", the mark of a perception whose sense of the universal essence of things has increased to such a degree that it extracts it even from a unique object by means of reproduction.

Where McLuhan differs from Benjamin is over Benjamin's conviction that cultural changes are concomitants of social and economic change and have to be understood in that context. McLuhan, on the other hand, offers an evangelical creed in which electronic technology will restore what cruder mechanical inventions have removed. For the price of our belief and enjoyment, there is the "global village".

The author is in the school of English and American studies at the University of East Anglia.

Research has indicated that the British diet may not be a very healthy one. Verner Wheelock investigates

Compared to most other developed countries, the British record of public health is poor. A recent analysis of European Community and Scandinavian data showed that mortality among men and women aged 15-64 was higher in the UK than elsewhere.

For every 10 women in the 55-64 age bracket dying of heart disease in Scotland or Northern Ireland, seven will die in England and Wales, five in Denmark, Belgium, Germany and Greece, and four or fewer in France, Holland, Norway and Sweden. The picture for men is very similar.

Diseases of the heart and arteries are responsible for much death and disability in contemporary Britain. Research is difficult to conduct because many factors contribute to the development of heart disease, and there is a long time span between cause and effect.

Nevertheless, considerable progress has been achieved and there are very strong indications that diet may be crucial.

The evidence is subjected to continual review. A recent evaluation was conducted by the official Department of Health and Social Security committee on medical aspects of food policy which considered the relationship between diet and cardiovascular disease. Most significantly, the committee recommended that there should be a reduction in total fat and in the saturated fat in the British diet, although there can be some increase in polyunsaturated fat. It is accepted that an increase in fibrous carbohydrates would be desirable, but there should be no increase in the consumption of simple sugars, and there should be some attempt to reduce salt intake. There is no specific recommendation on the consumption of cholesterol.

Essentially, similar conclusions were reached in the National Advisory Committee on Nutrition Education report, except that specified decreases in sugar and salt intakes were given. This report, published in 1983, was not restricted to cardiovascular disease and included information based on many other diseases/conditions including cancers, diabetes and obesity.

The NACNE report had no official status - it was actually designated as a discussion document - so that in theory it had no influence on the formulation of national policy on food. However, when the DHSS committee report was published nine months later it was immediately accepted by the Government. As a result, steps are now being taken to implement some of the recommendations - for example, most foods are likely to be labelled with fat content some time soon.

It would be quite unrealistic to expect the DHSS, or any of the Government departments, to have a dramatic impact on



The traditional British fish and chips - healthy or unhealthy?

We are what we eat

what people eat. Nevertheless, it may encourage healthy eating habits which are already developing as demonstrated by the following:

- Sales of wholesome and high fibre breads have quadrupled in the 10 years to 1982, despite the decline in the total bread market.
- There is a growing demand for high fibre breakfast cereals.
- Since pasteurized low fat milks (skimmed and semi-skimmed) were made available, there has been a big growth in demand. During 1984, the fat-reduced share of the liquid milk market increased from 4-13 per cent.
- Low-fat cheeses have appeared on the market. St Ivel has had particular success with its "Shape" range of low-fat dairy products, which are promoted for the mass market rather than for the specialized slimmers' market.
- In the "yellow fats" market, polyunsaturated margarines and low-fat spreads are gaining ground at the expense of ordinary margarines and butter.
- Lamb, which is considered to be a fatty meat by consumers, has shown a fall in sales, while demand for chicken has increased.
- There has been a steady increase in consumption of fruit and vegetables. Clearly, it is becoming easier for

individuals to make adjustments to their diet as the product range is extended and publicized. At the same time, the messages of the DHSS committee and the NACNE (despite its unofficial status) are being reinforced by professions such as GPs, teachers, dietitians and health visitors.

Local food policies are being established in many areas which are actively promoting the concepts of healthy eating. Consequently, it is highly probable that the existing trends will be maintained and so there will be significant changes for the food supply system.

Over the last 30 years, the balance of power in the food chain has shifted away from the primary producers and food manufacturers to the retailers, with the growth of the supermarket chains. Companies such as Sainsbury's and Asda can formulate very detailed product specifications which must be met by their suppliers.

In general, manufacturers are capable of responding effectively. In practice, it is not unusual to have a close working relationship between the supermarkets and their suppliers. However, there can be real problems as the impact of changing consumption patterns works its way through to the farmers.

Any examination of the effect of

diet/health concerns for farming must recognize that British agriculture is experiencing a significant transition. For at least a century this country has relied on imports for a significant proportion of its food supplies. Table 2 gives an indication of the very substantial increases in production which have occurred in the past two decades.

Britain is now self-sufficient in most of the major crops which can be produced at home. Some dairy products are imported, but these are primarily from European Community countries. Ironically, at a time when famine is endemic in many parts of the world, one of the major problems of agriculture in Britain and in the European Community is over-production, which results in the notorious butter mountains and wine lakes.

This is relatively expensive. Price levels are usually set so that the small, less efficient farmers have a viable income. This means that those with a large, highly efficient farm can make a very handsome profit.

Such a policy is becoming more and more untenable. Because producers of certain commodities including cereals, beef and lamb have a guaranteed market and a guaranteed price, they are essentially insulated from market forces - they are not specially interested in responding to consumer

demand. As things stand, there may be a financial disincentive for producing what the market requires.

If there is a reduction in financial support for farming from government, and European Community coupled with a restructuring or reorganization of the Common Agricultural Policy, then primary producers would become much more exposed to the markets. This would mean that agricultural production would have to be closely matched to consumer demands. Real difficulties can arise because patterns of food consumption can change very rapidly, but it may take years to make adjustments to farming systems.

To cope effectively, farmers of their agents will have to monitor consumer attitudes and behaviour towards food so that, like any other business, they can make assessments about future demands and prepare to respond to them.

With diet/health concerns it is possible to determine how demands are likely to alter. Essentially, a reduction in demand for fat would have implications for milk and meat producers, while an increase in consumption of fibre would translate into increased demands and pressure.

As the demand for milk fat falls, there is likely to be a corresponding reduction in the price paid to farmers for the fat. Within the last year, the price paid for fat relative to that paid for protein has been declining and it will probably continue to do so.

As this happens, it may soon be economically desirable to reduce the amount of fat produced - the ideal would be to alter the production process so that the protein output is increased while the fat output is reduced. There is virtually no information on how this can be done and it is important that research programmes aimed at producing milk with a reduced fat content should be initiated.

For meat, there should not be any major problem. It is quite feasible to produce lean meat, but the current payment systems do not reflect changes in consumer preferences. Alterations must be made so that farmers are given incentives for producing what the market requires and penalized if they do not.

There is considerable scope for increasing production of fruit and vegetables in this country.

Like any other major change, diet/health concerns will cause upheavals. As consumers alter their food patterns, demand for some commodities will fall but numerous new opportunities will be opened up. Farmers who show initiative and imagination can look forward with confidence.

The author is head of the food policy research unit at Bradford University.

Time to revise the old ideas

Any change in public attitude to ageing demands considerable impetus. While the process of ageing affects us all, there is still a measure of misunderstanding, myth and ignorance surrounding the subject. What is needed is an improvement in awareness among professionals in day to day contact with older people and also among a whole host of professionals - including architects, economists, political theorists and planners, sociologists, lawyers, administrators, leisure planners, journalists, local and central government officers - whose influence, though less direct, is vital. The range of occupations concerned in greater or lesser degree with the needs of older people is so great, and the level of special professional knowledge required so varied, that the demand can only be met by a strong commitment in higher education.

The rationale, however, is not only an academic one: it reflects what should be a growing concern in every corner of society. The traditional roles and methods of the university are immediately pertinent: interested scholarship and high-level teaching to focus critical power, disseminate new knowledge and dispel misunderstanding and ignorance, above all to educate new entrants to the professions and to update the practice of existing professionals.

The field of gerontology is fostered mainly in schools of medicine, though geriatrics (as medical treatment) is the main focus of attention there. One chair of gerontology has now been established (with a psychological orientation) but systematic teaching and research in aspects of gerontology is small scale, arising marginally from courses in other fields. In many disciplines, even in some professional programmes, older people do not feature at all.

Three levels of provision are urgently needed. There must be opportunity for all undergraduates to achieve some understanding of the problems and potentials facing older people in a changing society. There could be, first, general interest lectures open to all and, most important, optional units in ageing in a wide range of degree programmes, units of which would yield degree credit. There is every reason for scientists, technologists, future bank managers and civil servants, housing administrators and artists to become aware of a shared rationale for the new life style opening up for older people.

Further provision would enable all those preparing to work in the social field, in health or in education to acquire a depth of understanding of the contexts relevant to the lives of older people. The main aim here would be to encourage them to challenge traditional practice and expectations and to adopt an experimental posture in relation to what is possible, desirable and feasible for an older population.

More and more older people are taking up second careers, unpaid as well as waged. As well as serving as a reminder of what older people are capable of doing, consideration of the leadership and deliberative capacities of more experienced people is widely needed.

Within education, there has been an upsurge of self-help societies like the

University of the Third Age, run by and for the members, mostly retired and itself an example of older people taking collective responsibility for their own lives.

Meanwhile, in health there is a new understanding that deterioration is not inevitable, that physical and mental activity can defer the normally ineluctable ageing process.

Professionals in daily touch with older people need to be reflective and experimental in attitude. Education and training must therefore be up to date, in touch with the most recent research and with a strong international perspective. One vital aspect of provision is to educate the educators. The elements of gerontology exist within psychology, social science, philosophy, economics, medicine, biochemistry, geography and a range of other disciplines. What is required is a concerted attempt at synthesis, collation and rationalization in order that a body of gerontological knowledge can be bequeathed to future psychologists, economists, doctors and others, and disciplined research guaranteed.

The logic of this approach to teaching, research and theoretical effort is that each discipline will thereby be encouraged to foster scholars with a commitment to illuminating the psychology or the politics of ageing. Collaboration between disciplines will help provide the elements of the overarching, comprehensive theory which many seek and will assist the practitioner for whom an interdisciplinary approach is essential. The heavy response to the offer of a certificate and diploma in gerontology by the University of London shows the

Interest in gerontology - the science of age and ageing - continues to grow. Britain now has one academic chair in the subject and, as reported in *THE TIMES* a fortnight ago an Institute of Gerontology is to be established at King's College London. The wider issue, however, remains: how, in a society with a growing proportion of older people, to assimilate the problems and potentials of ageing to a wide range of subjects and approaches? SIDNEY JONES, himself a psychologist, looks at academic responsibilities in the area.



This is constructive and inviting social work practitioners.

One obvious problem in providing either general interest lectures or more structured course options is the lack of academic personnel with the special knowledge and commitment to shape these channels of innovation. Universities, polytechnics and colleges need to seek out those staff with special interests and to encourage them to develop structured academic programmes.

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BOOKS

Double feature

Cinema and State: the film industry and the British Government 1927-84
by Margaret Dickinson and Sarah Street
BFI, £18.00 and £8.95
ISBN 0 85170 160 4 and 161 2

The British Board of Film Censors: film censorship in Britain 1896-1950
by James C. Robertson
Croom Helm, £16.95
ISBN 0 7099 2270 1

It is not possible to understand the nature and role of the film industry in Britain unless the constraints within which it has worked are fully comprehended. Two in particular, government policy and censorship, are highlighted in two new books, which are both timely and indispensable. The recent controversies over the introduction of video censorship and the Government's decision to abolish the National Film Finance Corporation underline the continuing relevance of

both issues.

In *Cinema and State* Margaret Dickinson and Sarah Street draw on Board of Trade, Bank of England and Treasury papers to produce a thorough, careful, balanced and infinitely depressing account of the economic context of the British film industry. The industry's problems emerge with crystal clarity from this study as indeed they did from all the various reports and inquiries commissioned by the government over all its crisis-ridden history. The first is the strength of American domination of the market. As a 1976 report put it "Britain has for too long been an economic and cultural colony of Hollywood". America has traditionally used the British market to make its profit on its home-produced films and drawn on British facilities and talent to service its overseas productions. Whenever that dominance has been threatened, Hollywood has thrown all its political and economic strength into the fray to maintain it, going in 1947 to the extent of imposing a boycott to force the British Government to withdraw an import duty on American films.

The second problem has been chronic underinvestment, which handicapped genuinely imaginative cinematic impresarios like Michael Balcon and Philip del Giudice, ensured a succession of financial crises and paved the way for the emergence of the Rank monopoly. Even though the dangers of such a monopoly were regularly

pointed out, the government backed it as the best means of securing that elusive chimera—a breakthrough into the American market. Rank's expensive initiative failed. But for all the repeated calls for government action and the fine talk of cultural and national interests, the Government has too often been willing to take the line of least resistance and minimal intervention. This has been called "the failure of the trade". But since the "trade" has never been able to present a united front, the status quo has persisted. Even when the 1927 Act to introduce a protective quota was being framed, the industry could not agree on its terms, because the three sections, production, distribution and exhibition, had mutually incompatible aims. While the producers wanted to boost British film production, the distributors and exhibitors were more interested in facilitating the showing of popular and profitable American films. If the book has a fault, it is perhaps that its specific economic focus precludes it from acknowledging the important cultural role played by the Ministry of Information in the industry during the Second World War. But at the end of it, one cannot but be struck by the almost miraculous resilience of this "doomed" industry.

Another of the industry's hidden constraints was censorship, which is explored in detail in James Robertson's book. The British Board of Film

Censors (BBFC), set up by the industry itself in 1912, as a response to mounting criticism of film content, exercised a control over films far more stringent than that exercised over plays. This was because the cinema was the favourite medium of the working class, and the Establishment after the First World War was haunted by the spectre of popular revolution and feared the power of film to inflame. From this fear stemmed a policy of excluding all controversial issues from the screen and the imposition of middle-class standards of morality and decency, respect for law and obedience to the authorities. Despite its much-vaunted independence, the BBFC kept in close touch with government departments and did not hesitate to ban films thought to infringe the "national interest".

Robertson is the first historian to have had access to the official BBFC list of cuts and bans, which previous researchers were informed had been destroyed by enemy bombing during the Second World War, and uses it to present a revisionist interpretation. Where previous writers have emphasized the rigidity of the censorship code, Robertson demonstrates across a wide range of issues (crime, race, sex, and so on) that the censors were not always consistent and sometimes made more liberal decisions than might have been expected. But this may reflect more the difficulty of drawing hard and fast lines in cen-

sorship than a positive desire to adopt a liberal position. Continuity of policy and approach at the board was represented by J. Brooke Wilkinson, its secretary and conscience from 1912 to 1948. John Grierson described him in 1938 as carrying "the burden of our morality and our shame", and recent opinion has tended to see him as a dyed-in-the-wool reactionary but Robertson suggests that he was an "adaptable conservative", under whose stewardship the BBFC struck "an admirable balance between the commercial propensities of the film industry, the ideal of artistic freedom, the demands of the government... and the overall public interest". Certainly the prewar rules of the censors relaxed during the Second World War but then the BBFC took a back seat to the Ministry of Information and the demands of wartime propaganda, both social and political, inevitably eroded some of the former prohibitions. So how far Wilkinson was the architect and how far the victim of change is uncertain. But Robertson's new evidence materially extends our knowledge and his interpretation contributes importantly to the continuing debate about the functioning of censorship in society.

Jeffrey Richards

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Art for the people

Art Beyond the Gallery in Early 20th-Century England
by Richard Cork
Yale University Press, £40.00
ISBN 0 300 03236 6

Art, in the last ten or so years, has come out of its closet and into the open. By the early 1970s, the gallery had become a breathless vacuum in which art existed in supine inanimation indifferent to social or aesthetic function or even specific location. The retreat into self-referential purity robbed art of a social and public purpose while reducing it to an esoteric and highly marginal activity. In contrast, the community arts movement was genuine, if not always entirely successful, in its attempt to bring art, on an active and involved level, into the daily lives of ordinary people. And with the rise of the sculpture parks — one of the growth industries of recent years — the artist has had to acknowledge the responsibilities of a more open and public role as well as having to come to terms with the demanding requirements of a pre-existing and specific site. More recently architecture has shown signs of wanting a renaissance with art that would revive sculpture and decorative ornament as integral artistic and symbolic parts of the post-modern architectural scheme. These all are signs that art is once again venturing beyond the gallery.

The substance of the book is the half-dozen schemes undertaken by Jacob Epstein, Henry Moore, Wyndham Lewis, Spencer Gore, Charles Ginner, Eric Gill, Edward Wade, William Roberts et al which, between 1911 and 1929, imaginatively sought to take painting and sculpture out of the limiting confines of the gallery. The types of scheme encompass a wide range: two involve outdoor architectural sculpture for semi-public buildings (the British Medical Association and the Underground Railway Headquarters); two are for commercial ventures (the Cabaret Theatre Club and the Restaurant de la Tour Eiffel); one relates to a private interior (Lady Droghda's dining room); and the other deals more generally with the commissions carried out by the Omega Workshop. Each chapter incorporates related projects and activities which enable the reader to see how the particular schemes relate to their artist's current preoccupations and developing oeuvre.

Cork is a major authority on British art in the early 20th century, and his two-volume *Vorticism and Abstract Art in the Machine Age* was widely acclaimed and properly so. The profusely illustrated and well-designed *Beyond the Gallery* is equally authoritative and will make fascinating reading for anyone seriously interested in the British art of the period. It is thoroughly researched and clearly

written, and the author provides a comprehensive historical account of each scheme, as well as a rigorous formal analysis and full discussion of the symbolic or iconographical aspects of the works. The critical and public responses to the schemes are recorded — as always with Epstein his work caused consternation and controversy culminating in vitriolic and even vandalistic attacks — and serve to highlight the social mores of the period as well as reminding the reader of the difficult task faced by the artist of public work.

There are some lessons for contemporary practice to be learned from the schemes in this book. The Underground Railway building saga, for example, reveals just how important it is for the sculptor to be brought into the planning of a building early on if his work is not to be treated as, in Gill's words, "architectural fall-lals", and the importance of discipline and coordination in a design commission. Such lessons — in spite of the author's confession of personal commitment in the book "to the importance of art executed beyond the gallery's boundaries" in contemporary society — are not particularly emphasized and it is left to the reader to draw his own moral from each of the tales.

Bearing in mind the list of artists, it seems that the ventures Cork concentrates upon were "left overs" from his research into Vorticism and, although all are interesting in themselves and



"New office in Broadway for the London Electric Railways" by Muirhead Bonn, 1926.

Nigel Whiteley

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Still glides the stream

The Re-Creation of Landscape: a study of Wordsworth, Coleridge, Constable and Turner
by James A. W. Heffernan
University Press of New England, £25.00
ISBN 0 87451 312 X

"O Christ," wrote Coleridge, "it maddens me that I am not a painter or that Painters are not!" His mildly comic exaggeration is endearing, and revealing of his ever-aspiring and hopeful feelings could scarcely be more. He would like to be able to set down his feeling for landscape on canvas as well as in words. Constable was luckier, and he knew it: "Those scenes made me a painter," he said of his beloved Dedham Vale, "and I am grateful".

Coleridge and Constable are two of the artists studied in this book: the other two are Wordsworth and Turner. They are not "paired off" however, and there is no sense of "influence" at work between them (Professor Heffernan expertly disposes of this idea in an appendix). The four artists are held throughout the book in loose association, as lines of connection are subtly drawn between them: the book establishes its links in ways that are

illuminating, not only for romantic landscape art in general, but for the separate arts of poetry and painting, and for the lasting possibilities of comparison between them.

Painting, for Coleridge, was "the intermediate something between a thought and a thing". As soon as this is perceived as a possible definition of pictorial art, all kinds of interesting possibilities arise, concerned principally with different ways of rendering the external world. The romantics saw that painting was not the mere copying of nature, any more than poetry was; it could mediate between spirit and matter, and as soon as this was perceived, consciously or subconsciously, the parallels developed naturally. *Ut pictura poesis*, that axiom of 18th-century critical theory, was dead; long live *ut pictura poesis* in a new guise, more complex and more fruitful.

It is a considerable achievement of Professor Heffernan's to have perceived this, or rather rediscovered it, as he says, the painters and poets found new ways of making pictures poetic and poems pictorial. The foundation of this was their commitment to art as a record of private experience in its interaction with the external world. Landscape was particularly important in this respect; and if Ronald Paulson has described landscape painting as history painting with the history left out, Professor Heffernan makes his own more positive contribution by suggesting that in romantic landscape art there is a displacement of public history by private history. This can be the landscape of a significant moment,

as it frequently is in the case of Wordsworth; it can also be the private history of a time and place, what Professor Heffernan calls "the atmospheric history of a day". Such history, such perception, is a private encounter, a moment in the history of a mind in contact with a place at a certain moment.

The consequence of this is that the old discrimination between poetry as a "temporal" art and painting as a "spatial" art breaks down, to be replaced by more interesting lines of connection. Professor Heffernan feels his way into these in three chapters which develop out of his major theory of the individual landscape and the private mind. The first is concerned with the transforming nature of poetic language and of Coleridge's Wordsworth and Coleridge, for example, talked about "the modifying colours of imagination", and Turner and Constable were acutely conscious of atmosphere and chiaroscuro in Rembrandt. Carrying this one stage further, we have Hazlitt's reference to Turner's work as "pictures of nothing and very like". In every case, the transformation, and not the subject-matter, is what is important.

The second of these three chapters deals with borders and lines; Professor Heffernan rejects the usual description of romantic art as painterly rather than linear, and concentrates on the way in which the art of the infinite needs to be aware of the borders which it is crossing. Here the creative power of the human eye is important, and Turner's sense of curvilinear perspec-

tive is seen as having a parallel with Wordsworth's employment of stance and angle, and his rejection of mechanical ways of seeing. A third chapter deals with reflections: this asks us to rediscover what the word "reflection" means — that representation of nature through a medium which preserves it and yet transforms it, in a way which appears analogous to the workings of the mind.

The intricate theories of these chapters, and the foundation upon which they rest, are the results of careful thought and sharp observation. The evidence from the writing of the painters is shrewdly used, and their paintings are expertly analysed; only occasionally, as in the discussion of Constable's *The Cornfield*, does Professor Heffernan seem to be "reading" the painting in a way which happens to fit his theory. In identifying the drinking boy with Constable's childhood self, he closes off other interpretations in a way which limits the lovely openness of the painting. His discussion of Turner's *Temeraire* is much better: it is a moving account of the painting as a reconciliation of opposites, with an atmosphere of sadness and tranquillity. Moments such as this are among the best things in a book which is strong on theory and good on detail.

J. R. Watson

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BOOKS

Living economy

What is Political Economy? eight perspectives
edited by David Whynes
Blackwell, £19.50
ISBN 0 85520 746 9

What is political economy and does it differ in substance from economics? The contributors to this new volume of essays do see political economy and contemporary economics as being conceptually distinct. The deep divisions within economics, especially following the Keynesian synthesis, have led many economists to the conclusion that there is a deep-seated crisis within the discipline. But to the adherents of orthodox neoclassical practice economics there is no crisis, no need for a revival of political economy.

This collection of interesting essays reflects the personal views and reactions of each of the authors to the question posed in the title of the book. While some economists use the terms economics and political economy interchangeably, others regard them as "opposite sides of the same coin". For example Lord Robbins regarded political economy "as the application of economic science to problems of policy" embracing "all the modes of analysis and explicit or implicit judgements of value which are usually involved when economists discuss policy".

In a scene-setting introductory chapter Shaun Hargreaves-Heap and Martin Hollis present a spirited critique of neoclassical orthodoxy where "the centre of unease is the set of highly schematic assumptions which abstract from the bustle of the living economy". In Milton Friedman's view positive economics is an empirical science to be judged by its predictions but as the authors point out the testing of theories is notoriously difficult with the *ceteris paribus* assumption always acting as an escape clause.

Norman Barry discusses the Austrian perspective in chapter two and it is clear that this tradition in economics is distinct from the neoclassical economics of the Chicago school. Although both schools support a laissez-faire policy stance the foundations of these principles are very different. The Austrian approach, which has enjoyed a considerable revival in the past decade, owes much to the work of Ludwig von Mises and F. A. von Hayek. Both scholars regard the search for an objective predictive science of economics as an impossibility due to the uncertainty that pervades human action and the incessant change which characterizes the economic system. In Barry's view "the crucially important Austrian contribution to political economy is the explanation of how the co-ordinating process is disrupted by institutional factors". John Elliott's chapter covers the

institutional contributions to political economy made by Thorstein Bunde Veblen, Wesley Clair Mitchell, John A. Commons, Clarence Irving Lee and K. Galbraith. The main emphasis given by the group of economists is towards the importance of technological change, changing institutions and power relations as well as class and group conflict. The authors conclude by recommending closer co-operation between institutionalists and the Post-Keynesian analysis associated with Michael Kalecki, Joan Robinson and Piero Sraffa. Commons' *Public Control* provides a more effective challenge to neoclassical orthodoxy. In the two final chapters of part one Aron Rose reviews recent trends and controversies in Marxist political economy and Alan Hamlin examines the methodological basis of the public choice theorists.

Part two, on "Themes in Political Economy" contains three essays. First, two French post-political-economy relationships, David Whynes on international political economy, and finally Roger Bowles on property and the legal system.

Frey has for many years made seminal contributions to the political business-cycle literature although the original inspiration came with Kalecki's insightful paper of 1931, "Political Aspects of Full Employment". Kalecki's main concern was the long-term viability of full employment capitalism where the structure of power relationships in society would be transformed in favour of the workers. Kalecki concluded that recessions would need to be engineered by governments in order to restore the power of capitalists. Frey's political economics concentrates on the interdependence between the economy and the polity. Where governments are subject to an electoral cycle they can expect voters to evaluate their performance with regard to the economy. Hence governments may well attempt to manipulate the economy for political profit. Traditionally macroeconomic theory views government as an exogenous element in the system. By contrast Frey emphasizes the role of government as an endogenous part of the system. Thus, as is the case with all those who take a political economy approach, institutional considerations are crucial.

The unifying view of the political economy approach is a dissatisfaction with the dominant neoclassical model which often appears irrelevant to real world issues and emphasizes technique at the expense of analysis. For those who regard the quest for a pure science of economics naive in the extreme this set of essays will appeal. As Phyllis Deane recently commented in the *Economic Journal*, "There is no one kind of economic truth which holds the key to fruitful analysis of all economic problems, no pure economic theory which is immune to changes in social values or current policy problems". In short a healthy scepticism towards the variety of competing research programmes which can provide insights into the complex problems of society.

Brian Snowdon

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What to expect

Rational Expectations in Macroeconomics: an introduction to theory and evidence
by C. L. F. Atfield, D. Demery and N. W. Duck
Blackwell, £19.50 and £7.95
ISBN 0 631 13663 X and 13964 8

To provide an introduction for second and third-year students to a field which is largely technical, rapidly evolving and highly controversial is no easy task. This book succeeds admirably.

The rational expectations (RE) hypothesis is, in its simplest form, close to being a tautology. The evolution of any economic variable over time is partly the result of a systematic process and partly a result of random disturbances. The systematic process is in principle discoverable and predictable, the random element is unpredictable. Since economic agents will stand to gain from correct predictions and lose from incorrect ones, it will pay

them (up to the point at which the costs of acquiring the information exceed the likely gains) to discover the nature of the predictable element and base their expectations on it.

If the RE hypothesis is that innocuous, what is all the fuss about? There seem to be three parts to the answer. First, economists have been lazy in the past in using models of formation of expectations — notably "adaptive expectations" — which are plainly capable of producing systematic forecasting errors (for example with steady acceleration or with a regular cycle). Secondly, the assumption that people are able satisfactorily to discern the nature of each systematic process is held to be a very strong one. And, most importantly, the RE hypothesis has frequently been used in conjunction with market-clearing models to produce highly controversial new classical results, notably about the complete ineffectiveness of fiscal and monetary stabilization policies.

The present authors distinguish carefully and systematically between these three elements. They are on the whole sympathetic to the RE hypothesis in so far as the formation of expectations is concerned but sceptical about the validity of the particular kind of economic theory with which it has so



"The town of Sydney in New South Wales", an engraving from 1823 reproduced in Bernard Smith's *European Vision and the South Pacific*, published on July 25 by Yale University Press at £30.00.

Developing ideas

Pioneers in Development
edited by Gerald M. Meier and Dudley Seers
Oxford University Press, £34.00
ISBN 0 19 524522 2

This handsome volume contains ten essays, each written by one of the World Bank writers who produced seminal works in development economics and helped shape that subject as it emerged in the 1940s and 1950s. The authors are an eminent group — Gunnar Myrdal, Raul Prebisch, Paul N. Rosenstein-Rodan, Jan Tinbergen, Colin Clark, H. W. Singer, Lord Bauer, Albert O. Hirschman, Arthur Lewis and W. W. Rostow; they include three Nobel laureates. Interestingly no fewer than seven are of European (but only three are of British) origin; the other three are from the Americas (but only one from the USA). Each essay is followed by one or two commentaries by development economists of less seniority. The book also contains a useful introduction by Meier and a postscript by Paul Streeten.

Each essay was written in renaissance his early work, considering its assumptions, concepts and prescriptions "in relation to the way the course of development has proceeded". The result of several of these reassessments is wholly or largely to vindicate the writer's original views, at least to this own satisfaction; some of the commentators are less indulgent, notably Bela Balassa who provides the unpeppery controversy of Singer's thesis of the deteriorating terms of trade of developing countries. More than one of the papers reveal what Arnold Harberger, in his comment on Lewis's essay, calls a generation gap — a failure, or disinclination, to rephrase, modify or relegate earlier ideas in the light of the subsequent evolution of developing

countries and development thinking.

The initiators of development economics began their careers, or became professionally established, during the great depression of the 1930s (the oldest of those contributing to this volume was 33 in 1931, the youngest 15). Most of them shared the contemporary loss of faith in market mechanisms, and the growing belief that economic order and progress must be administratively created. They learned from Keynes that more than one kind of economics was possible, that what was taught through the orthodox texts could be only a special case. National accounting appeared to put within their grasp the data required for comprehensive economic management. They applied globally the economic perceptions, and even the terminology, of the slump in Europe and America — the unemployment problem, depressed areas, potential plenty, social overhead capital, basic needs, the welfare state, new deals and freedom from want. The belief became strongly entrenched that spontaneous economic action could not be trusted to relieve deprivation, least of all through international commerce. The later wartime debates on reconstruction engendered views now recognized to be naïvely utopian of what could be achieved by political decisions and administrative direction.

Although there was never consensus among the economists concerned with what in the 1950s were still called backward or underdeveloped countries, there is no doubt that by then a mainstream of development ideas was flowing vigorously. These ideas are still familiar, and their reiteration in this book is made in places with scarcely diminished conviction. They included assumptions about inelasticity in the factor supplies of aid and export markets for the countries concerned, the availability within them of surplus agricultural labour, the potency of an increased rate of investment in physical assets, the efficacy of centralized investment planning, the wisdom of contriving industrialization by policy and in substitution for imports, and the

necessity for international aid.

Rosenstein-Rodan, Prebisch, Singer and Myrdal belonged to this mainstream, indeed, along with the late Gunnar Myrdal, they largely determined its course. Rostow was connected to it by his prominent place in the US and lobby, and Tinbergen by his contributions to the methodology of development planning. Lewis and Hirschman were further removed, but both were (and are) attracted by structuralist hypotheses, and the latter in the 1950s was concerned more to refine than to refute the growth doctrine of Rodrik and Nurkse. In a separate category are the arch-empiricist Colin Clark, whose pioneering work on the quantitative facts of economic growth has been most closely paralleled by Kuznets, and Peter Bauer, who all along was the implacable critic of the mainstream prescriptions and now regrets only that he did not from the beginning fully recognize the harm they would do.

Development thinking has swung in Bauer's direction in recent years, though not much recognition of this swing is shown in the comments on his paper by Michael Lipton and T. N. Srinivasan. Emphasis has been put back on short-run efficiency and exploitation of current comparative advantages, and taken off the problem of long-run benefits of structural transformation. Public enterprise and the detailed administrative regulation of economic life are widely discredited in developing countries, although they do not as a result disappear. Development planning is scarcely taken seriously outside planning ministries (Harberger calls it a bygone fad). The aid lobby survives, but nothing is said nowadays of aid as an accelerator of Rostow's "take-off", and even the presumption that aid does or should finance capital formation is long since forgotten (indeed, the most remarkable passage in this book is that in which Myrdal explicitly recommends the concentration of aid on consumption purposes — satisfactory health care, schooling — along with the winding up of the specialized aid agencies).

In almost any sense of the term, development has been much taster in poor countries over the last forty years than was thought possible at the beginning of that period. The reason was the unanticipated rapid expansion of world trade. Whether the momentum has now been lost is far from clear; amazingly, while Clark identifies the years since 1972 as the dawning of a Kondratieff cycle, Rostow considers them the beginning of an upswing. At all events, development has occurred, and it is manifest in mortality rates, life expectancy, literacy and other changes in the quality of life as well as in the flows of economic goods and services. It is doubtful that much of the credit for these achievements belongs to the development economics of the 1940s and 1950s; it is not difficult to find instances where the mainstream prescriptions impeded rather than facilitated development. The subject was not a great generator of new knowledge, and in its policy role it often merely confirmed the prejudices of politicians and bureaucrats. Its exponents expressed the humours of their age. Would that we could do better!

Douglas Rimmer

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M. J. C. Surrey

M. J. C. Surrey is professor of economics at the University of Leeds.

BOOKS

'New' prehistory

Prehistoric Europe
by Timothy Champion, Clive Gamble,
Stephen Shennan and Alasdair Whittle
Academic Press, £28.50 and £14.50
ISBN 0 12 167550 5 and 167552 1

Good introductions to European prehistory are rare, and it is worth a brief look at the reasons why. Those like myself, who took degrees in prehistory in the late 1960s, relied upon what are now period pieces, mostly written by very senior academics who took a magisterial view of their field from the top of their academic pyramids. In those days, there was at least a consensus of what European prehistory was about: it was a humanist discipline, concerned with the prehistoric past of a small continent, and helped where needed by technical expertise from physicists, chemists and the like.

Then in the 1970s came the "new archaeology", a largely American response to European conservatism, which saw prehistoric archaeology as a social science, aimed at elucidating general laws of human behaviour regardless of time or place, and which was frequently highly critical of the earlier generation's often *ad hoc* methodology and preoccupation with historical narrative. These new attitudes were often enthusiastically

espoused by younger postgraduates, many of whom did much to improve archaeological methodologies for investigating general themes such as subsistence or trade. It is largely this generation that now has the task of writing what could be called the "new prehistory" – of writing a historical narrative that integrates the methodological developments of the past 15 years.

Prehistoric Europe is an excellent example of how this can be done at an introductory level. Its authors are the academic children of the new archaeology, with wide interests in recent methodological developments as well as considerable knowledge of their own periods and areas. All are in teaching departments, and so are familiar with the needs and expectations of first-year students. There are in the same department and thus aware of the problems of integrating courses. Admirably, they have succeeded in writing an account that is up to date in both what data are included (and left out), and in how the evidence can be viewed.

Together, the authors present informed, cogent, readable accounts of the whole of European prehistory: from the time when the continent was first colonized (perhaps a million or so years ago) to the emergence of modern man some 35,000 years ago; to the adaptations made to the glacial maximum 18,000 years ago, and the end of the last ice age eight millennia later; to the appearance of the first farming communities after 7,000 BC and the development of metal-using and hierarchically-organized societies after 4,000 BC; and more recently, to when literate societies became states and absorbed most of temperate Europe into their empires at the close of prehistory.

Important methodological aspects – for example, how to calibrate radiocarbon dates – are neatly brought in where appropriate in the form of separately-boxed summaries.

The problems of writing this type of book are greatly compounded by differences in the type and amount of information for each period, as well as the ways in which research has proceeded. Some areas, for example, have good records for some periods but not for others; much recent work on the paleolithic and mesolithic has concentrated on subsistence, whereas problems of social organization and trade have figured largely in recent work on the bronze and iron ages. Sensibly, the authors have concentrated on the most interesting aspects of each period, instead of trying to follow a single set of themes throughout the entire million-year span of European prehistory. In fact, the amount of thematic continuity between each period is surprisingly high, given the present state of prehistoric research, and it is doubtful if more could be achieved at present. Finally, the bibliography is excellent, with over 900 references (mostly from the past six years).

The authors have chosen their material well: third-year undergraduates and postgraduates will still find the book of value for their more detailed courses. This excellent book should serve as an anchor for degree courses on European prehistory for the rest of the decade at least.

Robin Dennell

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Civilized society

The European Iron Age
by John Collis
Batsford, £17.95 and £9.95
ISBN 0 7134 3451 1 and 3452 X

The Iron Age was a period of profound transformations in European society. Starting first in Greece, and spreading through Italy, Spain and transalpine Europe, a process of technological, economic and political change ultimately ushered in a society that was urban, literate and organized into states – in short, civilized. By the beginning of our era, Europe's first empire, that of Rome, had made a political unity of south, central and western Europe, and an even wider area to the east and north was radically transformed by connections to this empire.

These are weighty themes, but unfortunately their study has too often been fragmented between rival disciplines – ancient history, classical archaeology and prehistory. Few scholars would now be rash enough to claim mastery of all these data, but it is only through an integrated interpretation of these diverse fields, with their very different approaches to essentially similar problems, that a proper perspective can be gained on the events of the first millennium BC. This book is the first to treat the subject within this broad framework.

Despite its all-embracing title, however, the book does not attempt total coverage of Europe: events in Spain, where Phoenician colonization had a far-reaching impact, are scarcely mentioned, and northern Europe is only brought into the picture at the very end of the period, when relationships with the expanding Roman empire began to develop. The main focus of the book is in fact central European reaction to the emerging civilizations of the Mediterranean world, in particular Greece and Etruria. After a brief discussion of the reawakening of economic activity in the near east and the rise of the city states of archaic Greece, and the barest acknowledgement of the existence of the Etruscans and others in the traditional heartlands of European Iron Age studies, central Europe and its fluctuating interaction with the south.

The presentation is pitched at an introductory level, and the format adopted is ideal for such an approach: main text is comparatively short and can be read continuously, while



This 17th-century engraving depicts Africans diving for gold in the Ankobra river in Ghana, from *Historic Atlas of Africa*, edited by J. F. Ade Ajayi and Michael Crowder, to be published on July 22 by Longman at £45.00.

the captions to the plentiful illustrations contain much of the detailed comment on sites and objects. Such an approach, however, leaves little room for the discussion of many fundamental, though very contentious, arguments. It is perhaps understandable that such highly technical problems as the chronology of the sixth and fifth centuries BC (on which much ink, especially German, has recently been spilt, and on which Collis surely takes the right view) should be passed over; but there are other arguments, especially over the nature of prehistoric society and the relationship of social elites to the control of production and exchange, where wider discussion would have been appropriate. Factors which others have considered critical, such as control of land or of important resources, are barely mentioned, and there is little feeling of the enormous variety of the recent debate, especially the diverse contributions of such scholars as Michael Rowlands and Ludwig Pauli, on the nature of Iron Age society and social change.

Instead, at this introductory level, Collis prefers to give a more definite picture of our understanding of such problems, and to explain the phases of rapid social change which culminated in marked hierarchical societies in terms of the stimulus given by trade with the Mediterranean region. The close correlation of such long-distance exchange with aristocratic elites is

undoubted, but to cite trade as the prime – or sole – mover is grossly to oversimplify the process of interaction. Collis's approach causes real difficulties with the explanation of architectural, artistic and symbolic imitation of Mediterranean styles in temperate Europe, for which "trade" is simply not an adequate answer. He can offer no explanation, for instance, when there was a remarkable degree of similarity in mortuary ritual and elite symbolism in many areas of central and southern Europe, despite a lack of evidence for actual trade; and to relate the shifting pattern of power and wealth in the early fifth century to reorientation of Mediterranean trade does not really do justice to the complexity of the problem.

Although the text is marred with a number of errors, typographical and factual, in the absence of any other such introductory guide it will certainly be widely used. Its appearance will make available to English students an innovative synthesis of the widely scattered literature of an important period in the development of European society.

T. C. Champion

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Crisis of authority

Diocletian and the Roman Recovery
by Stephen Williams
Batsford, £17.50
ISBN 0 7134 4605 6

Few Roman emperors were more important than Diocletian, whose reorganization of the empire secured for it a new lease of life and relative stability; but the paucity of the literary evidence and the swift reversal of Diocletian's anti-Christian policies have led scholars to devote more attention to Constantine, Christianity's first imperial champion.

As Williams lucidly explains in his opening chapters, the main problem confronting Diocletian was that external military pressure, exercised almost continuously and often simultaneously at a multitude of points, had engendered a crisis of authority (as military usurpers multiplied) and of organization (as orderly supply of the army became increasingly difficult). Although the worst of the military crisis had been surmounted by Diocletian's Illyrian predecessors, it was against a background of constant military operations that Diocletian evolved the essential features of his reorganization: a great enlargement of the army coupled with an attempt to elevate the imperial person beyond the reach of military usurpation; and a division of the imperial authority among four emperors (the so-called "tetrarchy") combined with an intensification of administration designed primarily to secure a more rigorous and equitable exaction of revenue.

Williams admirably combines narrative and analysis. After describing the setting-up of the tetrarchy and detailing the important military operations of the reign (which left the empire in a stronger defensive position than for over half a century), he devotes five highly competent chapters to the various aspects of the Diocletianic reorganization. Three particularly striking features emerge: Diocletian maintained substantial field armies in far closer proximity to the frontiers than Constantine was later to do; the vast

taxation reform, however unpalatable to contemporaries, was an immense improvement on the random levies of previous decades; and the "absolute" associated with Diocletian's system was never wholly arbitrary but was tempered by Diocletian's almost obsessive respect for tradition and law. There is nothing particularly novel about any of these findings taken on their own; but what is impressive is the way in which Williams has drawn on the insights of recent scholars – Seston and T.D. Barnes on the detailed events of the period, Edward Lütwak on military strategy, A.H.M. Jones on the empire's organization and Ramsey MacMullen on its disorganization. Tony Honore on the imperial legislation – to produce a convincing synthesis of thoroughness and caution, of radicalism and conservatism, that characterized Diocletian's approach.

Two issues dominate Diocletian's later years – the persecution of the Christians and the abdication. Williams attaches rather less weight than I would to the dominance of Galerius after his Persian success, but he is right to pin the responsibility for the persecution on Diocletian himself, whose traditional ideology was now perhaps reinforced by neoplatonic intellectuals at court. Williams may be right in his view that abdication had not been envisaged, even if a date had been fixed in advance, but I am not convinced that the elaborateness of the palace split does as much to prove the point as he thinks.

There are some inaccuracies and exaggerations in this study, and ancient evidence is sometimes inadequately cited through secondary material or with insufficiently specific references. But Williams has succeeded magnificently in portraying the character of Diocletian's constructive response to the crisis of his time. In his closing chapters, he recognizes that Diocletian's reforms were neither wholly successful nor, where successful, fully beneficial. Byzantine bureaucracy was used to prove a very mixed blessing; but it is doubtful whether the empire could have survived without it.

John Creed

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Human origins

African Archaeology
by David W. Phillipson
Cambridge University Press,
£25.00 and £9.95
ISBN 0 521 25234 2 and 27236 X

There are archaeologists who need to be introduced to Africa, and Africanists who need to be introduced to archaeology. So far as the Stone Age is concerned, both purposes will be served by this admirably authoritative and concise account. After more than a decade of field experience in Zambia and Kenya, David Phillipson – now Curator of the Museum of Archaeology and Anthropology at Cambridge – has cultivated a talent for widespread survey and synthesis, shown notably in his *Later Prehistory of Eastern and Southern Africa*.

Phillipson's concise summary of the archaeology of human origins is both sober and satisfying. No writer has yet to my knowledge succeeded in conveying to the uninitiated an adequate conception of what was really happening during the immense period during which men over most of the inhabited world used the same basic Achaeulian tool-kit (pointed and almond-shaped stone hand-axes); and Phillipson is doubt right to present it mainly in terms of expansion from an East African cradleland. More original, and yet entirely convincing, is his decision to combine treatments of Middle and Late Stone Age cultures in a series of region-by-region studies emphasizing the element of local continuity from one stage to the next.

The best and most significant parts of the book are the two chapters which deal with the beginnings of settled life and food-production. It has long been apparent that there is an unacceptable contradiction in the received opinion that a long "preparation" for food-production – based in the region of Africa between the Sahara and the Equator and involving the intensive

gathering of wild cereals and the management of wild fauna – found fulfilment in the more or less passive reception of domesticated brought in from Asia. Phillipson has the courage and good sense to argue for a long view of cereal domestication, which began with the intensive gathering of wild cereals, including barley, in the very exceptional conditions of the Nubian Nile of 15,000 years ago. This takes us a long step forward in recognition of what has hitherto been a minority view.

However, the final quarter of the book, which deals with the Iron Age, will be every bit as confusing to the beginner as the corresponding section of the *Later Prehistory*. In particular, Phillipson does nothing to clarify earlier views on how the expansion of Iron Age food-production into Africa south of the Equator is related to the parallel expansion of the Bantu languages throughout the same region. More generally, when it comes to the interface between archaeological, traditional and documentary sources, Phillipson manifestly loses his sureness of touch. With a few exceptions, only the work of archaeologists is actually cited, even where the archaeological contribution to the problem in question has been a quite minor one. The medieval history of the Sudan is presented without a mention of the written "tarikh" of Timbuktu and Jenne, that of the Indian Ocean coast without the Kilwa chronicle, and that of Ethiopia without any proper reference to the written literature. The interface between archaeology and traditional history in the Great Lakes region of East Africa is very superficially and incomprehensibly treated. This is a pity, especially since it is so hard for beginners to realize that three-quarters of a book may be sound and the rest misleading.

Roland Oliver

Roland Oliver is professor of history at the School of Oriental and African Studies, London.

A Keyguide to Information Sources in Archaeology by Peter Woodhead has been published by Mansell at £21.50

BOOKS

Analytic criticism

Gottlob Frege: Collected Papers on Mathematics, Logic and Philosophy
edited by Brian McGuinness
Blackwell, £28.50
ISBN 0 631 12628 3

Gottlob Frege is widely acknowledged both as the inventor of mathematical logic and as the founder of analytic philosophy and modern philosophy of language. Brian McGuinness's collection makes available for the first time in English nearly all of Frege's articles and reviews published during his life. These range from the treatise on geometry which gained him his doctorate at Jena in 1873 at the age of 25 to the third chapter, "Compound thoughts", of his projected *Logical Investigations*, which appeared in the journal *Beiträge zur Philosophie des deutschen Idealismus* in 1923, two years before Frege's death. The volume thus encompasses half a century of thought on mathematics and the philosophy of logic and language. Its appearance, coming shortly after the collections of his *Philosophical Writings* (Blackwell, 1979) and *Philosophical and Mathematical Correspondence* (Blackwell, 1980), makes available in English virtually the entirety of Frege's surviving writings. Only a complete English translation of both volumes of *Grundgesetze der Arithmetik* is lacking.

About one-third of McGuinness's volume consists of material previously unavailable to scholars ignorant of German, most of it constituted by the two dissertations written by Frege in his twenties, and by a critical study, published in 1899, of H. Schubert's account of the foundations of mathematics in the *Encyclopaedia of the Mathematical Sciences*. (The publishers' sleeve describes Frege's piece as "satirical", cognoscent of Frege's brand of "rational" will not be disappointed by the extraordinarily heavy-handed mixture of sarcasm and sledgehammer which follows.) The other previously untranslated material consists largely of reviews and short notes, mostly composed before 1885. The volume also contains a translation (though not the first, contrary to the editor's claim) of Frege's review of E. G. Husserl's *Philosophie der Arithmetik*. There is accordingly little new insight to be gleaned here into the interpretation of Frege's thought after *Grundgesetze* (1884), although there is a fair amount of new material to interest the student of Frege's development before that work and the historian of nineteenth-century mathematics. In any event, it is good to have the 1890s papers on the philosophy of language in a single volume with *Logical Investigations*.

Once again, I was impressed by the lifelong vigour and intellectual energy of Frege's thought and by his genius for analytic criticism; and, yet more

forcibly, by the rising note of exasperation as Frege struggled for the critical attention of his contemporaries. In *Grundgesetze* he had argued carefully, and successfully, that the concepts of cardinal number, and of the individual numbers, cannot be conceived as the terms of processes of "abstraction" (in the sense enjoyed by that term in the theories of concept formation of the empiricists). "Red", for instance, expresses a property shared by red things which it is not implausible to think might be grasped by abstracting away from other incidental differences between them. But the same cannot be maintained for the adjective "two". The point is important because of its connection with Frege's liberating proposal to regard number as higher-order property: a property of concepts. But it seems to have been quite lost on its intended readership.

Ten years later, in the review of Husserl, Frege, writing with increasing impatience, has to go over all the same ground again; indeed, the critical part of the review substantially consists of recapitulation of arguments from the path-clearing sections of *Grundgesetze* which present Frege's positive proposals there. Husserl himself seems to have taken many of Frege's points to heart, but no general consciousness of them appears to have filtered through. Another five years sees Frege arguing them yet again in the critical study of Schubert. Finally (1906), in response to an article by J. Thomae, his patience snaps utterly: "why must I always repeat the same arguments? Twenty-two years ago in *Grundgesetze*, paragraphs 34–38, I presented at length what must be considered when dealing with this question; and in paragraph 48 in particular I indicated the reason why one is tempted to derive numbers via abstraction. Is my whole effort, then, to have been in vain? Is my attempt to discuss this question as thoroughly and penetratingly and understandably as possible, weighing arguments and counter-arguments – all this effort simply to have been wasted? Is all this to have been written into the wind? ... I regret that I know of no admissible means, be they parliamentary or literary, of shooting these opinions back into their haunts, so that they never again dare emerge into the light of day."

The tone of Frege's paper was indeed so "unparliamentary" that Thomae was given space for a brief reply in the same journal. Without, by his own admission, having read beyond the first four pages of it, Frege seems to have regretted the matter, publishing a much more restrained, and therefore more pointed, account of the difficulties in Thomae's formalistic views two years later. But that was his last publication for a decade. Truly it was the reception of Frege's work, every bit as much as the ragged hole which Bertrand Russell had torn in the foundations of *Grundgesetze*, which very nearly crushed him.

Crispin Wright

Crispin Wright is professor of logic and metaphysics at the University of St Andrews, and editor of *Frege: tradition and influence* (Blackwell, 1983).

Roots of logic

Plaget's Logic: a critique of genetic epistemology
by Muriel Seltman and Peter Seltman
Allen & Unwin, £30.00
ISBN 0 04 370154 X

How can we even hope to describe the highest mental processes? Perhaps the starkest choice we face as psychologists is between the everyday language of "folkpsychology" (using terms like "believe", "intend", and so forth) and the less flexible but more rigorous language of computational psychology (whose concepts are derived from artificial intelligence). The former choice generally commits us to studying what lies "outside" the individual thinker in his material and social milieu. The advantage here is that a considerable degree of intelligibility and interest is thereby guaranteed; with the clear disadvantage being that one may get locked into an explanatory circle, never getting beneath the everyday level.

Conversely, computational psychology

provides an account of the mind as a complex set of interacting systems that is sufficiently satisfying to convince many cognitive psychologists that this is what underlies mental life as we know it. But others would contend that artificial intelligence only provides the conceptual tools for analysing distinct, automatic, and unconscious ("modular") performances, and that it may actually mislead us about the nature of the central processes.

Piagetian theory suggests a kind of middle way. The late Jean Piaget, who combined the realism and human relevance of folkpsychology with the formalism and cybernetic outlook of the computational approach. The realism lay in his proposal that the roots of logic are to be found in actions on objects. For successful interaction with the concrete world demands a very determinate set of expectations about our experiences of them, so determinate indeed that Piaget was able to claim that actions must form a logical structure. For instance, given a straight path A-B-C there is a kind of necessary truth in the realization that we cannot pass along the path from A to C without traversing B. He even used mathematical group theory to describe the self-regulatory nature of

Covering laws

Minds, Machines and Evolution:
philosophical studies
edited by Christopher Hookway
Cambridge University Press, £17.50
ISBN 0 521 26547 9

Evolutionary biology, evolutionary epistemology, computer simulation: consciousness, the origins of language, the unit of selection – the linking thread to the papers in this collection is simply their naturalism – now the reigning orthodoxy among those interested, whether as philosophers or scientists, in the brain and behaviour. No harm in that, but the reader will be disappointed if he expects the authors to engage each other to more than a minimal extent.

Three papers are concerned with very different aspects of artificial intelligence (AI). Roughly, Daniel Dennett is sympathetically critical. Yonick Wilks speculatively and engagingly optimistic, and Margaret Boden cautiously ambitious. The latter is a better description – that AI might get somewhere in helping us understand something about conscious mental processes, while insisting that non-conscious levels of description may be where the real (and problematical) work remains. If Dennett is right – and his scepticism about AI rather understates the extent of the problem – the achievement might prove to be very limited. Wilks, however, is presumably untroubled by the claim that AI might not get far in producing models of human capacity, for he uses computers rather as metaphors, sources of illuminating categories wherein to couch questions about consciousness; Boden expects insight rather from the actual programs. Well, maybe.

Running underneath several articles, and surfacing in one of them (David Hull's), is psychology's status as a science: if it is a science, how much does it resemble "established" sciences like physics? This is an old but perennially absorbing question: physics has been psychology's *supergoal* since Wilhelm Wundt set experimental psychology going. Hull rejects the *supergoal*; psychology isn't after laws at all, it's after narrative explanations – what have been called "how-possible", rather than "covering-law", accounts.

Hookway's own article is interesting. He contrasts two American pragmatists, C. S. Pierce and W. V. O. Quine. Pierce distinguished epistemology from the natural sciences, insisting that it is prior to them and that it must therefore make no use of empirical material drawn from the sciences. Quine reverses this, claiming that the "enlightened" epistemologist should now view his enterprise as subordinate to – part of – psychology. To go along with either, or neither, of these views would or should determine both what one thinks epistemology, and what one thinks the human sciences, ought to be – but unfortunately none of the other papers engage with this question.

There are eight nice articles in this collection. There might have been eight nice articles scattered through the journals, I doubt that there was any particular reason for collecting them, apart from the prestige of the Fritz Thyssen Stiftung, who sponsored the meeting from which this collection stems.

Kathleen Wilkes

Kathleen Wilkes is a fellow of St Hilda's College, Oxford.

This illustration from Biome's *Gentleman's Recreation* (1686) depicts the use of spaniels in hawking: the dogs crouch in response to a hand-signal from their master. The drawing is reproduced in David McFarland's textbook of *Animal Behaviour* (Pitman, £11.95).

they do express their thoughts in their own words the results are not happy. "On the other hand," they say as early as page six, "becoming-in-the-context-of-being, and vice versa (Hegel's conception of it), expresses co-existent aspects of Actuality (*sic*), that is, the coincidence and co-terminousness of being-and-becoming."

As it happens, the exegesis is being undertaken to show that Piaget's theory is not only irredeemably wrong-headed but deeply corrupting. The major flaw is that of "conflation", in this case "the conflationary involvement of group, logic, number and psychological 'structures' into one indiscriminate mass". This is corrupting because of the dire social consequences that are supposed to flow from it. As I understand the authors' case, this leads us to allow too much authority to reality (sorry, "Actuality") which they helpfully tell us is "sometimes referred to as 'reality' or 'fact'". The individual is made helpless within a straightjacket of logic, is forced to bow down before an authoritarian model of how things are. If you "conflate" the structures of concrete reality and of logic, then apparently this is what happens.

Now sociologists such as Anthony

Wilden have made some quite insightful criticisms of Piagetian theory addressed to its quietism (for it is an equilibrium-based theory, and Piaget has applied it in social analysis). But the Seltmans' presentation of their vaguely similar thesis does not even deserve to be taken seriously. They criticize Piaget for being a muddled thinker, but compared to this book Piaget's most idiosyncratic writings would be easy meat. The authors are obscure, however, not because they have anything deep and difficult to say but because they do not communicate at all well and their writing is absurdly pretentious (one can only guess at the nature of the thought that underlies it). They deploy nothing that a philosopher would call an argument or that a psychologist would call evidence (unless you count their cheap insinuation on page 314 that a logico-mathematical world-view led Piaget to regard the Nazi war with complicity). Much of their book is nothing more than a gray labyrinth of pseudo-arguments, and richly deserves to be ignored.

James Russell

James Russell is senior lecturer in psychology at the University of Liverpool.

A paperback edition of Laurie Buxton's *Mathematics for Everyman* has been published by Dent at £3.95.

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Applicants for all above positions should be well qualified academically and have academic research, business or industrial experience. Candidates should have an active interest in and commitment to research. Applicants for all Senior Lecturer posts should hold a Ph.D. or equivalent.

Salary Scale:

Senior Lecturer: £16,859 - 22,005

Lecturer: £16,003 - 19,952

Assistant Lecturer: £16,146 - 19,373

Application forms and further details are available from the Personnel Office, National Institute for Higher Education, Glasnevin, Dublin 9. Closing date: 2 August, 1985.

UNIVERSITY OF LONDON

Chair of English Language and Literature Tenable at King's College London (KQC)

The Senate invite applications for the above established Chair. Candidates with a particular interest in some aspect of English Literature from the Renaissance to the present day will be preferred.

Applications (11 copies) should be submitted to the Academic Registrar (THES), University of London, Malet Street, London WC1E 7HU, from whom further particulars should first be obtained.

The closing date for receipt of applications is 30 August 1985.

University of Newcastle upon Tyne

LECTURESHIP IN ARCHAEOLOGY

Applications are invited for a Lectureship in the Department of Archaeology.

The person appointed will be expected to teach, supervise research, and to supervise research, study in the field of European Prehistory.

Salary will be at an appropriate point on the Lecturers' salary scale: £7,530 - £9,000 per annum, according to age, qualifications and experience.

Further particulars may be obtained from the Senior Lecturer, Dr. J. B. Kenyon, The University of Newcastle upon Tyne, Newcastle upon Tyne NE1 7RU. Applications should be sent to the Academic Registrar, The University of Newcastle upon Tyne, Newcastle upon Tyne NE1 7RU. Closing date: 31 August 1985.

University of Reading

Department of Mathematics

Applications are invited for

5 YEAR FIXED TERM LECTURESHIP IN APPLIED MATHEMATICS

Applications would be particularly welcome from candidates with research interests in the following areas: Differential Equations, Numerical Analysis, or Computational Fluid Dynamics.

Salary on scale £7,530 to £14,925 (under review) plus USS/USDP benefits.

Further particulars and application forms (2 copies) are available from the Academic Registrar, The University of Reading, Whiteknights, Reading RG6 2AA. Closing date: 31 August 1985.

Please quote Ref. No. 151349.

Applications will be accepted until the post is filled.

Further particulars and application forms (2 copies) are available from the Academic Registrar, The University of Reading, Whiteknights, Reading RG6 2AA. Closing date: 31 August 1985.

Please quote Ref. No. 151349.

Applications will be accepted until the post is filled.

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Please quote Ref. No. 151349.

NATIONAL INSTITUTE FOR HIGHER EDUCATION DUBLIN

Applications are invited for the post of:

Senior Lecturer

In the School of Accounting and Finance. This School offers a BA in Accounting and Finance, a Post Graduate Diploma in Accounting and an MA Degree in Management Control.

The candidate appointed will specialise in one of the following areas:

Finance

Management Control

Computer Applications in Accounting.

Duties attaching to the post will arise mainly from the undergraduate and post graduate courses run by the School and from the supervision of research students.

Applicants should be well qualified academically, holding a Ph.D. or equivalent and have academic, research, business or industrial experience. Candidates should have an active interest in and commitment to research.

Salary Scale:

Senior Lecturer: £16,859 - 22,005

Application forms and further details are available from the Personnel Office, National Institute for Higher Education, Glasnevin, Dublin 9. Closing date: 2 August, 1985.

Applications will be accepted until the post is filled.

Further particulars and application forms (2 copies) are available from the Academic Registrar, The University of Reading, Whiteknights, Reading RG6 2AA. Closing date: 31 August 1985.

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Please quote Ref. No. 151349.

The University of Leeds

Department of Sociology

MINING COMMUNITIES AND SOCIAL CHANGE

Applications are invited for a Postgraduate Research Fellow in the Department of Sociology.

The successful candidate will be expected to conduct research in the field of mining communities and social change.

Applicants should have a Ph.D. or equivalent and have academic research, business or industrial experience. Candidates should have an active interest in and commitment to research.

Salary Scale:

Postgraduate Research Fellow: £7,530 - £9,000 per annum, according to age, qualifications and experience.

Application forms and further details are available from the Academic Registrar, The University of Leeds, Leeds LS2 9JT. Closing date: 2 August, 1985.

Applications will be accepted until the post is filled.

Further particulars and application forms (2 copies) are available from the Academic Registrar, The University of Reading, Whiteknights, Reading RG6 2AA. Closing date: 31 August 1985.

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Please quote Ref. No. 151349.

The Queen's University of Belfast

Department of Mathematics

LECTURESHIP IN ENGINEERING MATHEMATICS

Applications are invited for a Postgraduate Research Fellow in the Department of Mathematics.

The successful candidate will be expected to conduct research in the field of engineering mathematics.

Applicants should have a Ph.D. or equivalent and have academic research, business or industrial experience. Candidates should have an active interest in and commitment to research.

Salary Scale:

Postgraduate Research Fellow: £7,530 - £9,000 per annum, according to age, qualifications and experience.

Application forms and further details are available from the Academic Registrar, The Queen's University of Belfast, Belfast BT7 1NN. Closing date: 2 August, 1985.

Applications will be accepted until the post is filled.

Further particulars and application forms (2 copies) are available from the Academic Registrar, The University of Reading, Whiteknights, Reading RG6 2AA. Closing date: 31 August 1985.

Please quote Ref. No. 151349.

Applications will be accepted until the post is filled.

Further particulars and application forms (2 copies) are available from the Academic Registrar, The University of

Technical Colleges

01-253 3000 EXTN. 226

Industry and Commerce

LECTURER

Process Control Industry

A leader in the field of process control, our Client is active in worldwide markets such as oil and gas, pulp and paper, food processing and energy management. Their business is expanding rapidly, due largely to their commitment to excellence in product design, in application knowledge and in providing before and after sales service.

They currently seek a talented and enthusiastic Lecturer to join the small team involved in organising courses and providing instruction for customers at all levels, from simple operating, through to sophisticated configuration courses in software applications and programming.

Some overseas travel may also be involved as our Client's customer base is truly international. This is an exciting opportunity for a technically-minded man or woman qualified to at least HND level and with a broad knowledge of electronics and/or control room instrumentation. An attractive salary will be negotiated according to experience and an extensive benefits package is available.

Interested? Then please contact Michael Dunning at Crawford Halls Harrison Cowley Recruitment Limited, 5-7 Forth Road, Maidenhead, Berkshire SL6 1RP. Tel: 0628-26162 (24 hour answer phone).

CHHC

Crawford Halls Harrison Cowley Recruitment Ltd.

Conferences and Seminars

GRESHAM COLLEGE
SPECIAL LECTURE SERIES
A Public Lecture

THE RT. HON. LORD YOUNG OF GRAFFAM
"THE FALL AND RISE OF THE ENTREPRENEUR"

at
The Old Library, Guildhall, London
on
MONDAY, 22ND JULY AT 6.30 P.M.

Prior to his appointment as Minister without Portfolio Lord Young was a Special Advisor to Sir Keith Joseph and a distinguished Chairman of the Manpower Services Commission from 1982. He is also a Member of the National Economic Development Council. He is a fervent believer that Britain cannot cure its economic and social problems without a positive return to an enterprise culture.

Admission Free
by ticket only on application to

Special Lecture Organizer
Gresham College, Level 12
Frobisher Crescent, Barbican, London EC1 1LA
Tel: (01) 638 0353 ext. 292

Examiners

The Institute
of Linguists
Educational Trust
MODERATORS:
ENGLISH, FRENCH,
ITALIAN, SPANISH

The Institute wishes to appoint Moderators for each of these languages. This is a position in the Institute's examinations, and requires appropriate experience and interest in language examining and language teaching.

Applicants must be qualified in the language, or native speakers with appropriate qualifications, and conversant with the contemporary situation of the country concerned.

Letters of application, giving relevant qualifications and career details, and the names of two referees, should be sent to: The General Secretary, The Institute of Linguists Educational Trust, 24A, Highbury Grove, London, Tel: 01-353 7445.

Further information will be sent on request. The closing date for applications is 16th August, 1985. (51401) H30

Research and Studentships

Camborne School of Mines

TEMPORARY RESEARCH ANALYST/ PROGRAMMER

The Governors of the CAMBORNE SCHOOL OF MINES wish to appoint a Research Analyst/Programmer to develop and apply computing techniques to a variety of Research Projects at the School. The successful applicant will probably possess either a good honours degree in Computing/Mathematics, appropriate numerical subject, two years' experience writing scientific programmes and a thorough knowledge of Fortran. This is a temporary post for 3 years.

Application form and further details from the Registrar at the School. Closing date 22nd July 1985.

The University of
Manchester
Marine Resources Project
(P.R.E.S.T.)

RESEARCH
ASSISTANTS/
ASSOCIATES
(FIVE POSTS)

Applications are invited from candidates with experience and training in geology, oceanography, biology, economics and engineering, who are interested in the marine resources of the world. The project is a joint venture of the Marine Resources Project and the University of Manchester. The successful applicant will be involved in a wide range of research and development work, including the collection, processing and analysis of data, and the preparation of reports and publications.

Salary will be according to experience and qualifications, and will be in the range £5,000 to £10,000 p.a.

Further information and application forms from the Registrar, The University of Manchester, 13th Floor, Oxford Road, Manchester M13 9PL. Tel: 061-275 3131. (51401) H30

Research and Studentships continued

UNIVERSITY OF BIRMINGHAM
RESEARCH POSTS

Applications are invited for the following research posts in Departments in the Faculty of Science and the Faculty of Engineering:

FACULTY OF SCIENCE
Department of MicrobiologyPostdoctoral Research
Fellowship (ref. M2)

To work on the replication strategy of potyviruses and aspects of resistance. Experience in plant virology of nucleic acid biochemistry would be an advantage. Candidates about to complete their PhD will be considered. Post tenable for up to 17 months and funded by AFRC.

DEPARTMENT OF BIOCHEMISTRY
Research Associateship (ref. B6)

The project is to investigate the activation of the expression in E. coli by cyclic AMP, using recombinant DNA technology and, in particular, DNA synthesis. Post is tenable for up to 3 years and is funded by SERC.

FACULTY OF ENGINEERING
Department of Engineering Production

Research Associateship (ref. P8)

To participate in a robotics research programme concerned with the development of a novel electro-chemical method of automated flash removal from forgings by robotic device. Post is tenable for up to 18 months and is funded by SERC in collaboration with Professor McLaughlin at Edinburgh University and GKN Forgings, Bromsgrove. Applicants should be graduates in mechanical/production/control/systems engineering or physics.

DEPARTMENT OF TRANSPORTATION AND
HIGHWAY ENGINEERING
Research Associateship (ref. R2)

To work on an SERC/DOE(NI) Roads Service project to develop a rapid and continuous method for the measurement of rut depths of a road pavement. The work will include computing, laboratory and field work. Post is tenable for up to two years. Applicants will be able to register for a higher degree and should have a good honours degree in Civil Engineering or Physics.

DEPARTMENT OF METALLURGY AND
MATERIALS
Postdoctoral Research
Fellowship/Research
Associateship (ref. U2)

This is an industrially-supported project involving superplastic forming of aluminium alloys with the objective of making innovations in design and forming methods for superplastic parts. The successful candidate will be a metallurgist with practical engineering ability or an engineer with a good materials background. Post is tenable for up to 3 years.

Salary Scales
Research Fellow 1A £7,520 - £12,160 p.a. plus superannuation
Research Associate 1B £6,800 - £8,920 p.a. plus superannuation

For further particulars, telephone 021-472 1301 ext. 2559 quoting reference number.

No formal application form, three copies of application, including full curriculum vitae and naming three referees to Assistant Registrar (Faculty of Science) and Assistant Registrar (Faculty of Engineering), P.O. Box 363, Birmingham B15 2TT by Thursday, 25th July, 1985

(020335)

University of
Liverpool
Department of Mechanical
EngineeringApplications are invited for
the post of
SERC AND A
SERC CASE
STUDENTSHIP

Leading to the degree of Ph.D. The SERC studentship is co-sponsored by James Howden Ltd. and will be concerned with a fundamental study of the clearance of fouling heat exchangers. The SERC studentship is available to students who are interested in the application of mechanical and chemical engineering to the design and construction of heat exchangers.

Candidates should possess upper Second Class Honours degree. Applications, together with the names of two referees, should be sent to the Registrar, University of Liverpool, P.O. Box 147, Liverpool L69 3BX. Quote ref. RV/143. (51355) H12

University College
London
Faculty of LawsRESEARCH
ASSISTANT

Formalized agreements in Family and Welfare proceedings

A graduate with a background in social sciences is required for an empirical project on the above topic under the direction of Dr. David G. Green. Experience of interviewing an advantage.

One year (in the first instance) from October 1985 on by arrangement. Salary range £5,600-£7,980 (under review). 61357. H12

Applications to, and further information from, the Assistant Registrar, Faculty of Laws, University College London, Gower Street, London WC1E 6BT by 18th July 1985.

Written further particulars and application form from the Assistant Registrar, Faculty of Laws, University College London, Gower Street, London WC1E 6BT by 18th July 1985.

(020335)

University of
BradfordRESEARCH
ASSISTANTS
IN
CHEMICAL ENGINEERING

(2 posts - fixed-term 3 years)

Applications are invited from candidates with good degrees in appropriate engineering or science disciplines for a project involving experimental study of gas purification by pressure swing adsorption, including measurement and correlation of equilibrium and kinetic data. Emphasis will be on computer simulation using an existing commercial package. Opportunity to register for a post may be given to a successful candidate. Salary with range £6800 - £8800 p.a. Superannuation.

Application forms and further particulars from the Deputy Secretary (Ref: RA/CH/DE/THES), University of Bradford, West Yorkshire BD7 1DP. Applications to be submitted by 26.7.85.

The salary is related to age and experience. It is very important that an appointment will be offered to anyone over 35. (51360) H12

SHEFFIELD CITY
POLYTECHNIC
Department of
Accountancy and
Company
Administration

BURSARIES

Funds are available for two bursaries, for students wishing to study for a higher degree in one of the following areas:

Applications are invited from candidates of post doctoral status with experience in physical chemistry, occupational hygiene or welding engineering to join a research team investigating the mechanism of fume and gas formation in metal arc welding. The work is sponsored by ESAB Group UK and is directed to the control of the health hazards of welding. Salary on scale £7520 - £12160 p.a. (under review).

Application forms and further particulars from the Deputy Secretary (Ref: HAE/SH/THES), University of Sheffield, West Yorkshire, S10 2TN. Applications to be submitted by 26.7.85.

(020335)

Goldsmiths College
University of LondonRESEARCH
ASSISTANT

In Sociology for a period of three years commencing from 1st October 1985. The candidate will be expected to work on a research project with the Department of Sociology. The following areas:

(i) The Sociology of Crime
(ii) The Sociology of Health and Illness
(iii) The Sociology of Gender

Salary on scale £5,181 - £8,424 - £8,927 - £9,910 per annum plus 12.5% London Weighting.

Write for further particulars to the Assistant Registrar (Personnel), University of London Goldsmiths College, New Cross Road, London SE14 6NW. Closing date for receipt of applications 26th July 1985.

The College is an Equal Opportunities Employer. (51358) H12

University of
WarwickRESEARCH FELLOW/
ASSOCIATE

The Institute for Employment Research has a vacancy for a Research Fellow/Associate for a period of three years commencing from 1st October 1985 with salary in the Research Scale £11,150 p.a. (under review). This is a new appointment.

The successful candidate will be involved in a research project on the relationship between employment patterns, work attitudes, household and community organization. The successful candidate should have some experience of in-depth interviewing, data analysis and proven research skills in the area of local labour markets and social organization.

Applications, enclosing C.V. and giving the names of three referees, should be made to the Registrar, University of Warwick, Coventry CV4 7AL. Further particulars can be obtained from the Assistant Registrar, University of Warwick, Coventry CV4 7AL. Closing date for applications 26th July 1985.

(020335)

Research and Studentships continued

Durham University
Business SchoolRESEARCH
ASSISTANT

Industrial Relations in Small Firms

Applications are invited for the above post from well qualified Social Scientists preferably in Industrial Relations, Industrial Sociology or Economics. The project is a longitudinal study on the process of industrial relations in small firms, sponsored by the Department of Employment.

The post, which will involve travel within the United Kingdom, will be to provide assistance with field work and report writing. Experience of interviewing would be useful, as would the possession of a driving licence.

The salary will be £6,600 per annum, plus superannuation. Applications (3 copies) together with the names of three referees should be sent not later than 26th July 1985 to the Registrar and Secretary, Old Shire Hall, Durham DH1 1TA, from whom further particulars may be obtained.

The salary is related to age and experience. It is very important that an appointment will be offered to anyone over 35. (51360) H12

Cambridge Group for
the History of
Population and
Social StructureSENIOR ASSISTANT
IN RESEARCH

The Group hopes to be in a position to make an appointment with effect from 1 October 1985, or as soon as possible thereafter. The successful candidate will be expected to undertake research on topics related to one of the following: English population history; co-residence, kinship and family phenomena; the demographic system in England 1650-1950. The appointment will be for five years, renewable for a period not exceeding four years.

The pensionable salary of the post is £21,500. The salary will be £21,500 a year, rising by five increments to £21,500.

Further information may be obtained from the Director, Cambridge Group for the History of Population and Social Structure, 27 Trumpington Street, Cambridge CB2 1QA, to whom applications, including a curriculum vitae, list of publications and the names of 3 or 5 referees, should be sent as soon as possible, and not later than 30 July. (51370) H12

Overseas

Monash University
Melbourne, Australia
Department of PoliticsFIXED TERM
(3 YEAR)
LECTURER

In one or more of the following fields: Australian government and policy matters; Political Development and Comparative Politics with special reference to South-East Asia; Political Behaviour. Enquiries to Professor H.V. Evatt.

Salary: A\$34,467 p.a. Applications including Ref. No. 50513, curriculum vitae and three references to the Registrar, Monash University, Victoria, 3168, Australia, by September 30, 1985.

An Equal Opportunity Employer. (51340) H14

Overseas continued

NATIONAL UNIVERSITY OF
SINGAPORE

Department of Japanese Studies

Japanese Economics
Japanese History and Politics
Japanese Sociology

Preference will be given to candidates who can teach Japanese language courses at all levels.

Gross annual emoluments range as follows:
Lecturer \$30,660-63,570
Senior Lecturer \$37,590-101,930
Associate Professor \$89,300-123,000

(SGD\$1 - \$82.89 approximately)

The commencing salary will depend on the candidate's qualifications, experience and the level of appointment offered.

Leave and medical benefits are provided. Under the University's Academic Staff Provident Fund Scheme, the staff member and the University are each required to contribute at the present rate of 25% of his salary, the contribution of the staff member and the University being subject to a maximum of \$1,250 per month and \$1,750 per month respectively. The sum standing to the staff member's credit in the Fund is tax-free and may be withdrawn when the staff member leaves Singapore/Malaysia permanently.

Depending on the type of contract offered, other benefits may include: a settling-in allowance of \$1,000 (single) or \$2,000 (married); subsidized housing at nominal rentals ranging from \$100 to \$320 p.m.; education allowance for up to three children, subject to a maximum of \$10,000 per annum per child; passage assistance and baggage allowance for the transportation of personal effects to Singapore. Staff members may undertake consultation fees up to maximum of 60% of their gross annual emoluments in a calendar year.

Application forms and further information on terms and conditions of service may be obtained from:

The Director
Personnel Department
National University of Singapore
Kent Ridge
Singapore 0511

NUS Overseas Office
c/o Singapore High Commission
5 Chesham Street
London SW1
U.K. Tel: 01-235 4562 (02035)

UNIVERSITY OF
SOUTH AFRICA

Applications are invited from suitably qualified persons for the following vacancies at the University.

UNISA is a fore runner in distance learning and although based in Pretoria, has centres throughout South Africa and students all over the world.

CLASSICS

Chair or Associate Professor in Classical Greek Language and Literature. Applications should indicate experience and qualifications in Classical, Hellenistic and Patristic Greek, also Latin and Ancient History.

Senior Lecturer/Lecturer/Junior Lecturer in Ancient History Greek and Roman and Histrography. Applicants should specify their qualifications and experience in Ancient History, Latin and Greek.

ROMANCE LANGUAGES

Associate Professor/Senior Lecturer in French. Senior Lecturer/Lecturer/Junior Lecturer in Italian, Spanish or Portuguese.

Applications close 9th August 1985.

Application forms and further information regarding the University, salaries, fringe benefits etc can be obtained from the South African Universities Office, 278 High Holborn, London WC1V 7HE. (020359)

LECTURESHIP IN MELBOURNE
LECTURER: Aphasia,
Dysarthria and Orofacial
Disorders

The School of Communication Disorders, Lincoln Institute of Health Sciences, Melbourne, Australia, seeks a speech pathologist or other suitably qualified person. Primary responsibilities include teaching at undergraduate and postgraduate levels in communication disorders of neurological origin and orofacial disorders, and also clinical supervision. The School seeks to promote research activities. Applicants with research interests are particularly encouraged to apply. A higher research descriptor of the position which is a two/three year term (following which there is a possibility of renewal, or a tenurable). Lincoln Institute is a College of Advanced Education. The School of Communication Disorders conducts a four-year programme leading to a Bachelor of Applied Science degree in Speech Pathology, and an associated graduate programme. Enrolments total approximately 210 and there is an academic staff of 18.

The appointment will be made at Lecturer level (AUS\$28,238-34,850,000; AUS\$28,700-34,850,407). A higher level of appointment (Senior Lecturer) may be offered to an exceptionally well qualified and experienced applicant. For an overseas appointee, higher rates would be met and there would be an allowance for removal expenses. The Institute would also contribute towards travel and removal costs for dependants.

Applications in writing, quoting position No. 050135, including the names and addresses of three professional referees, should be addressed to Assistant Registrar, Lincoln Institute of Health Sciences, 825 Swanston Street, Carlton 3053, Victoria, Australia. Closing date 30 September 1985. Enquiries to Dr. John Sarno, Tel: (03) 342 0277.

LINCOLN
INSTITUTE
OF HEALTH
SCIENCESNew Zealand Council
for Educational
Research

DIRECTOR

Applications are invited for the above position. The Council is a non-profit making research organization, financed by grants from the Government and other sources, has a staff of approximately 18 research personnel and 80 administrative, clerical, editorial and secretarial assistants.

As chief executive of the Council, the Director is expected to provide professional leadership in developing and coordinating its research programmes. Additionally, the successful candidate will be required to inform and advise the governing body, to direct the Council's publishing and information services, and to supervise the administrative and financial organizations in New Zealand and other countries which will also be a requirement of the position.

The salary offered will be within the range specified for full primes and senior executives of the New Zealand University, presently from \$55,515 to \$86,600 depending upon experience and qualifications. Applicants are requested to supply a letter of application, a curriculum vitae, a photograph and the names of three referees who should be consulted about their suitability for the post.

Detailed information on NZCER and on the requirements of this position is available on request from the Assistant Executive Officer, New Zealand Council for Educational Research, P.O. Box 3837, Wellington, with whom correspondence should be lodged by 31 August 1985. (51355) H14

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PUBLICATION

THE UNIVERSITY OF NEW SOUTH WALES
SYDNEY AUSTRALIA

Industrial Laser Photochemistry

Senior Research Scientist,
Research Scientist
Postdoctoral

Applications are invited for several positions in a research group which is developing laser-based industrial photochemical processes. Experience in lasers, photochemistry, optical spectroscopy, and industrial applications would be helpful.

The University of New South Wales contracted with the Commonwealth of Australia to work intimately with the Australian chemical industry to develop new commercial processes using lasers. Successful candidate processes are to be taken to the pilot plant design stage.

Since July, 1984, funding of A\$1 million has been used to set up a laboratory in Australia to work intimately with the Australian chemical industry to develop new commercial processes using lasers. A further A\$1 million has now been contracted to provide for additional staff and equipment. Appointments will be for one year, with possibilities of continuing depending on additional funding. Sabbatical or postdoctoral applicants are welcome.

Work involves investigation of scientific feasibility of proposed processes, optimisation studies, small-scale reactor tests, followed by preparation of a project proposal for the Australian chemical industry. A pilot plant design has been submitted to the government for additional funding and a second pilot plant is under discussion with the company involved. Funding is available for patents, and two worldwide patents have been submitted.

In addition to working with state-of-the-art equipment and collaborating with industry on real-world problems, applicants will have the opportunity of working with a Project Technical Leader of international stature. Industrial liaison is handled by the Project Manager. Project staff will collaborate with workers from industry who are associated with the six processes being investigated. Applicants will be expected to be technically strong, and opportunities exist for publication in the open literature.

Salaries will be commensurate with experience, and will be up to A\$38,700. Applications close September 15. Appointees will be expected to commence work as soon as possible, and no later than January 1, 1986. Call Dr. George Paul, Project Manager (512) 697-4586, (512) 458-5585 (home), Telex UNRS AU44854. Or write Dr. Paul, School of Physics, University of New South Wales, Kensington, NSW 2053, Australia.

Equality of Employment Opportunity in University Policy.

(020359)

THE TIMES HIGHER EDUCATION

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An eight page special report, published in The T.H.E.S. on March 22, 1985.

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- 'manpower shortages at technician level'

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A six page special report, published in The T.H.E.S. on March 29, 1985.

The report looks at the future of management education and where the emphasis should be placed during the 1990s. The following are among questions discussed by contributors from the world of Management/Business Studies.

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